GENETIC PSYCHOLOGY MONOGRAPHS

Child Behavior, Animal Behavior, and Comparative Psychology

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EDITED BY

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AUGUST, 1946

(Manuscripts are printed in the order of final acceptance)

THE RELATION OF EMOTIONAL ADJUSTMENT TO INTELLECTUAL FUNCTION 3
By J. Louise Despert, M.D., and Helen Oexle Pierce

THE SMILING RESPONSE: A CONTRIBUTION TO THE ONTOGENESIS OF SOCIAL RELATIONS . . . 57
By Rene A. Spitz, M.D.

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THE RELATION OF EMOTIONAL ADJUSTMENT TO INTELLECTUAL FUNCTION*

The New York Hospital, and the Department of Psychiatry, Cornell University Medical College

J. LOUISE DESPERT, M.D., AND HELEN OEXLE PIERCE

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I. SCHOOL AND TESTING ENVIRONMENT

Personality studies of normal children of preschool age have been in progress at the Payne Whitney Nursery School since 1937. Anamnestic data, physical examination reports, psychometric test findings, daily behavior records and mechanically-recorded individual play sessions are collected on each child. This method of compiling data makes it possible at any time to study special phases of behavior through the analysis and integration of specifically-related information from the records.

This study represents an attempt to ascertain whether any relation can be established between emotional adjustment as shown in the total record and intellectual function as determined through psychometric testing, also to follow variations of the intelligence quotient on retest in parallel with fluctuations in the emotional adjustment as reported in the records. Owing to the specific method of approach, and time relations being readily available causal relations can be worked out without any pre-established hypothesis.

Eighteen children, from 2 to 5 years of age (divided into three groups) attend the Payne Whitney Nursery School yearly. This is a well equipped nursery school, with opportunities for indoor and outdoor activities, whose modern methods of nursery education are carried out by trained adults assigned to a very small number of children. This permits close observation, as well as greater freedom of expression. The children come from high cultural and social strata. The parents—many of them are professional people—have been college graduates, with one exception. To be admitted, a child must be of normal (or superior) intelligence and present no gross deviations in his early development, or his past and present behavior. The child is tested for intelligence prior to admission only when his intellectual status is doubtful on initial interview observation, or highlights of his psychomotor development point to the need. As is the case with any so-called normal group of children, at any age level, upon continued observation a certain number are found to present deviations of various degrees from the normal. There are two factors which cannot fail to influence the parents in their selection of the school: the nursery school is located in a psychiatric hospital, with the services of a psychiatrist attached; and it is known to be a center of observation.

The hospital atmosphere is not foreign to the children, as they enter the psychiatric building to go to their school rooms. Contact with patients is avoided; occasionally, however, they are seen in the garden. The children pass the psychologist's office daily, on their way to the roof playground;

and the psychologist is a familiar figure, to the same extent, for instance, as is the nurse, since anyone called upon to test or examine the children is first made an intimate part of their school experience. This is also true to an even greater extent of the child's contact with the psychiatrist.

The psychometric test which is done regularly each year is suggested as another enjoyable school event, and the children eagerly look forward to their turns. Occasionally a child is shy about leaving his group and going to the psychologist's office. Then his teacher takes him, either alone or with another child (already tested and enthusiastic about the procedure), and remains with him until he is willing to accept the testing situation. It can be said that conditions are favorable in assuring maximum coöperation from the child, thus leaving variations in test scores to be explained by factors other than the test situation itself.

II. METHOD AND PROCEDURE

From the fall of 1937 through December of 1943, 81 children were enrolled, and 77 were given the Stanford-Binet test (Terman-Merrill revision) by four psychologists. The average *IQ* on initial tests was 121.44 (range, 79 to 164). As indicated above, while the children are not selected on the basis of superior intelligence, as a group they show intelligence considerably above average. Two or more Binet tests were available on 39 children, and it is from this group that the observations and findings reported in this study are drawn.

A careful investigation was made of the records of these 39 children; the results of the psychometric tests and the findings related to the socio-emotional adjustment were analyzed *independently,* and in 33 of the 39 children there was a close parallel between the two sets of findings. From the point of view of variations in *IQ* in the Binet tests, the total number was divided into two groups: *Group I,* 22 children who showed gains or losses in *IQ* of 10 points or more on retest, arbitrarily defined as the group with significant changes; *Group II,* 17 children with minor (less than 10) or no changes on retest, defined as the group with insignificant changes. Group I was further differentiated as follows: subgroup (*a*), 12 children with significant changes upward; subgroup (*b*), 10 children with significant changes downward.

III. REPORT OF FINDINGS

A. Group I, Subgroup (*a*): 12 Children with Significant Changes Upward

There were increases ranging from 10 to 31 points. All the children included in this group showed parallel increase in intellectual quotient, and improvement in social adjustment. Pertinent data on these 12 children are briefly summarized as follows:

Case 1 (Boy): *IQ* up 21 points (79-100): Greatly improved social adjustment. (This boy had been admitted to the Payne Whitney Nursery School before the institution of research; his initial intellectual level might have excluded him under conditions as outlined since the establishment of research.) (Illustrated.)

Case 2 (Boy): *IQ* up 16 points (90-106): An inhibited boy who gradually became freer, happier, more animated.

Case 3 (Girl): *IQ* up 15 points (129-144): Improved social adjustment. After she left Payne Whitney Nursery School (two years later) she was seen for follow-up guidance, when she developed behavior difficulties in school. Her *IQ* then was 130.

Case 4 (Boy): *IQ* up 17 points (93-110): School behavior showed considerable improvement during his two years at school.

Case 5 (Girl): *IQ* up 10 points (111-121): One of identical twins; extremely dependent on her sister during her first year. Growth in independence from her twin marked her progress.

Case 6 (Boy): *IQ* up 12 points (105-117): Improved emotional and social adjustment in an immature boy who was admitted to the school shortly after the parents' separation.

Case 7 (Girl): *IQ* up 15 points (97-116-112): During the last two of her three years at school, this child was happy and well adjusted; but during her first year at school, marked by the birth of a sibling, her adjustment presented minor difficulties which are reflected in her lower intellectual performance. (Illustrated.)

Case 8 (Girl): *IQ* up 17 points (110-117-127): Gradual growth and social improvement, with gradual increase in her three successive tests.

Case 9 (Boy): *IQ* up 31 points (125-131-156): Considerable improvement in adjustment in the course of three years. (Illustrated.)

Case 10 (Boy): *IQ* up 22 points (110-132): At first, apprehensive and inhibited. Became more aggressive, and freer.

Case 11 (Boy): *IQ* up 21 points (123-144): Better adjusted, more mature in behavior and speech expression, a gradual development.

Case 12 (Girl): *IQ* up 13 points (97-110): Social improvement well related to increase in intellectual performance.

B. GROUP I, SUBGROUP (*b*): 10 CHILDREN WITH SIGNIFICANT CHANGES DOWNWARD

There were decreases ranging from 10 to 19 points. In five of these children, the lowering of intellectual performance was coincident with a period of conflict stimulated by the arrival of a sibling, and in still another was related to the sibling, though not his birth. There were concomitant signs of emotional conflict, such as regression in elimination training, infantile habits, etc. The parallel between intellectual performance and social adjustment in the 10 children is highlighted as follows:

Case 13 (Boy): *IQ* down 13 points (157-144): Gradual improvement during the first year at school. A brother was born at the beginning of his second year, and the second psychometric test was given shortly thereafter. (Illustrated.)

Case 14 (Girl): *IQ* down 19 points (138-119): A generally tense child who had a period of regression related to the younger sister (a very attractive baby) when the latter began to walk and became a center of attraction for the whole family. (A follow-up contact indicated a further drop, with school difficulties.)

Case 15 (Girl): *IQ* down 10 points, then up two points (144-134-136): An only child, of older parents, who was attractive and generally well adjusted. During the second year play sessions, the child expressed anxiety which was related to the old nurse who had almost complete charge of her. The nurse's possessive love and somewhat dictatorial attitude were a source of conflict to the mother. It became known that she was involved in small thefts right before the child, which finally prompted the mother to discharge her.

Case 16 (Boy): *IQ* down 14 points (148-134): An anxious child whose parents had neither much insight nor time. Between his first and second years at school, a sibling was born; and while his social adjustment showed gradual improvement at school, the play sessions revealed an intense sibling rivalry which was not satisfactorily handled at home.

Case 17 (Girl): *IQ* down 16 points (137-121): School adjustment showed improvement, but there was an undercurrent of tension related to hostility toward the mother and sibling. (Illustrated.)

Case 18 (Boy): *IQ* down 13 points (121-122-108): An anxious boy with fairly wide variations in his adjustment; his restlessness and anxiety were on the increase during his third year at school, due to tensions in the family and the birth of a sibling between his second and third tests.

Case 19 (Girl): *IQ* down 15 points (137-122): An increasingly anxious child who required special guidance and attention during her two years at school, and who was later brought to treatment for behavior difficulties at a private school. (Her *IQ* then showed a further decrease.) This child's problem was related to poor adjustment of the parents, who were resistive to suggestions through the child's contact at school. Nevertheless, they brought her back occasionally for check-ups after she had left school. Both parents were eventually referred for treatment.

Case 20 (Girl): *IQ* down 16 points (155-141-139): A generally well adjusted child who went through a period of conflict and frustration coincident with the birth of a sibling. (Illustrated.)

Case 21 (Boy): *IQ* down 22 points, then up 16 points (132-110-126): This only child, of older parents, was active, happy and well adjusted. During his second year at school his mother, who was very devoted to him, became involved in a number of war committees which restricted her contacts with the boy. Temper tantrums, frequent and severe, appeared, and it was in that period that the second test took place. In conferences with the mother, the child's emotional needs (revealed in play session material, as well as in daily behavior) were pointed out; and the mother, a warm, well integrated individual, was quick to give up interfering activities. The psychometric tests closely reflect the fluctuations of this child's adjustment.

Case 22 (Girl): *IQ* down 12 points (133-121): The parents put high demands for achievement on this (only) child. Due to over-stimulation, this girl had, for instance, a vocabulary considerably above average, but she was also inhibited and fearful. Her social adjustment showed progress. However, her second test was given just after the Christmas holiday, which was a period of tension in the family.

C. GROUP II: 17 CHILDREN WITH INSIGNIFICANT CHANGES

It was in this group that predictability on the basis of independently-analyzed reports offered less chances for reliability. While it seemed possible retrospectively to justify results of the psychometric tests in the light of the total record, the findings of the psychometric tests could not so consistently be forecast from the biographical data, as was the case with the children in the first group of significant changes. In this group (II) two categories of children are represented: stable, well adjusted children whose home life seemed to present no cause for emotional disturbances; and children whose home conditions, while unsatisfactory, did not show variations, or tendency toward marked improvement, or further dislocation. It is in this latter category that the margin of error was greatest. The 17 cases are briefly summarized as follows:

Case 23 (Boy): *IQ* down nine points (128-120-119): This child showed continued tensions through his three years' attendance but, nevertheless, made great progress in school adjustment. He was an only child of young, immature parents. Home conditions, especially regarding interparental relations, became increasingly unfavorable, with acute tensions and rejection of the child. One would be justified in expecting a greater drop. (Illustrated.)

Case 24 (Girl): *IQ* stable (108-109-108): An unusually independent child of carefree, casual parents. She was active, friendly, well liked. No indication of any conflict, either in daily behavior or individual play sessions.

Case 25 (Girl): *IQ* up three points (142-145): She was the youngest of three girls in a household overwhelmed by the female element. (The father was rather passive, and several of the servants were women.) The competition with her older sisters was intense, and school provided a means of developing emotional independence. Her progress in social relationship was greater than the change in *IQ* would indicate. However, this child, during her second year, went through a period of boy-girl adjustment which added complexity to the total picture.

Case 26 (Girl): *IQ* up six points (121-127): There were elements of instability in the home. The father had a history of severe stuttering. He still stuttered mildly, was somewhat rigid and compulsive. The mother spent very little time at home. The child was an active thumb sucker, and continued to be until at least the age of 8½ years, when a check-up was made on all the children. Individual play sessions and dreams demonstrated rather intense underlying anxiety. There was a period of disturbed behavior when the father left for the Army (the child was then 8 years old). While the nursery school was a gratifying experience (there the child became more sociable and happy) and there were no outstanding causes for conflict during her two years' attendance, no rise in *IQ* could be predicted on the biographical record alone. This rise, though slight, and considered insignificant by criteria outlined above, indicates a trend which is not in keeping with the rest of the record.

Case 27 (Boy): *IQ* stable (125-125): A well integrated boy, with warm and demonstrative parents. There was no indication of any emotional conflict in daily behavior or individual play sessions. (Illustrated.)

Case 28 (Boy): *IQ* down seven points (129-122): This only child (from a broken home), in the custody of his mother, was made quite unhappy by the divorce and loss of his father; this was also true of his mother. Two years after the child left school, a check-up revealed behavior difficulties for which the mother was seeking guidance. A greater drop in *IQ* could have been expected in this case, although the home conditions became even worse after he left school.

Case 29 (Boy): *IQ* up four points (96-100): During his two years' attendance, this boy gained in emotional stability. However, it was felt that a deep-seated insecurity, revealed in individual play sessions, warranted treatment; and this was instituted two years later when the boy became involved in stealing fairly large sums of money and valuable articles, both at home and the private school which he attended.

Case 30 (Boy): *IQ* up seven points (115-122): This was a rather shy boy, protected and "bossed" by his older sister (who was also at Payne Whitney Nursery School during his first year there). The parents, well adjusted and with high standards, demanded rather rigid compliance, but they were consistent and gave security and affection to their children. The child became more assertive, and independent of his sister; and the trend indicated in the minor change in *IQ* rating is in keeping with the improvement in social behavior.

Case 31 (Girl): *IQ* up nine points (124-133): The younger of two children, this girl had an older brother who was also at Payne Whitney Nursery School. She tended to be shy and passive in her first year. She gained in independence, and her social behavior also showed gain. A generally well adjusted child.

Case 32 (Girl): *IQ* down five points (109-104): Upon admission, this child's behavior and speech were quite immature. Considerable progress made in both areas is not reflected in the change in *IQ* which, while insignificant, indicates a trend in the opposite direction to that expected.

Case 33 (Girl): *IQ* stable (113-114): This child, the dominant one of twins, "bossed" her sister and, to some extent, isolated her from the group. A well adjusted child of secure parents. Her social contacts broadened in the course of two years at school.

Case 34 (Boy): *IQ* up three points (120-123): The third of four children, three of whom attended Payne Whitney Nursery School. Although the family is well knit and both parents give affection and security to the children, the older boy and this boy have had stormy periods—in the case of this child, characterized by hostility and aggressiveness toward other children. Such periods coincided with frustrations at home (mother's illness, nurse's favoritism of the youngest child) between his first and second years at school.

Case 35 (Girl): *IQ* down five points (136-131): The second of three children (all have attended Payne Whitney Nursery School), and the sister of Case 27 (page 14). All three children, while presenting marked individual differences, have a common characteristic, in that they are secure and well adjusted. The second psychometric test was given two months after the birth of the third child; mild sibling rivalry was present, which was resolved after a short period of time. While insignificant, the lowering of the intellectual quotient indicates a trend quite in keeping with the life situation. (Illustrated.)

Case 36 (Girl): *IQ* down three points (140-137): This child had a difficult time during her two years' attendance. Her parents were divorced, and each remarried; and a child was born in each of the new marital combinations. School was an increasingly happy experience for this child, but frustrations at home did not lessen perceptibly.

Case 37 (Girl): *IQ* stable (127-126): The record of this child is an almost exact reduplication of that of Case 36 (divorce, both parents remarried, a child born of each couple). In this case, however, the improvement in emotional adjustment was more striking than in Case 36, and this might have been reflected in an increase in *IQ*.

Case 38 (Girl): *IQ* down four points (122-118): This child was overactive, lacked concentration. She was an only child, and there was *friction between mother and daughter.* The *improvement in her* behavior was great enough to warrant a shift upward in *IQ,* rather than a loss of four points.

Case 39 (Boy): *IQ* up three points (99-102): An only child, adopted by older parents. During his first two years at school, this child was apprehensive, insecure, poorly organized. There were tensions in the home, due to personality adjustment of the father and the mother's difficulty in accepting her childlessness. Indeed, both parents eventually accepted treatment, and at the time of writing (incomplete third school year) the child showed a considerable gain in both social adjustment and intellectual function (*IQ* 118). The latter finding, though not included in the general classification due to incompleteness of the year's data, is highly significant in the light of changes in the home situation.

IV. ILLUSTRATIVE CASES

A. GROUP I, SUBGROUP (*a*): CASE 1, CASE 7, CASE 9

1. *Case 1—Boy—IQ Up 21 Points (79-100)*

Case 1 was the only child of older parents. Observed from 2 years 6 months to 3 years 10 months. Under "research conditions" this child might have been rejected.

a. Physical status. Underdeveloped, poorly nourished, with poor motor coördination. There was evidence of early rickets and slight convergent strabismus. Absences for colds were high (19 per cent in the first year, 38.6 per cent the second year). Allergy was reported several years after he left Payne Whitney Nursery School, which kept him out of kindergarten and grade school two-thirds of the time.

b. Social background. There were several abortions preceding the child's birth. Pregnancy *was an accident, and the rejection was obvious.* The parents were older, self-contained people with high intellectual and cultural standards. Birth was premature, with low forceps. The mother was quite ill (uremia); the child weighed 5 lbs. at birth. There were several maids, speaking different languages. He had no contact with other children before he came to school and his speech was a mixture of words from several foreign languages. It was reported that the child was so apprehensive in new situations that he would not, for instance, void on all-day trips.

c. School adjustment, first year. At school he was apprehensive with regard to voiding and for several days he did not void all day. There was compulsive, ritualistic behavior, such as inclining his head to one side and revolving slowly in a circle, with peculiar repetitive hand motions. His mother had to stay at school with him more days than is usual, because of his timidity. He was silent and apprehensive, play was solitary, occasionally parallel. He was playful with adults whom he knew. He showed fears and withdrawn behavior. He was afraid of others' aggression and had no initiative, nor was he possessive of toys. Motor coördination was poor.

d. School adjustment, second year. Due to his apprehensiveness, also to absences because of poor health, he did not make a good contact with the children in his group. He showed hostility toward them. There were fewer fears and his peculiar mannerisms decreased coincident with greater freedom in play. He still exhibited peculiar hand motions when anxious or self-conscious. He played only with one girl; he was *passive, but gradually he dared to hit her. Later he pulled the hair* of other children but was cowed when they attacked him. He remained dependent on his teacher for a long time and was apprehensive in new situations. On the whole, his behavior showed improvement, in that he was less anxious, more sociable. Throughout the period of observation, he was more friendly toward men.

e. Psychometric tests. The first test, at 3 years 3 months, gave him a mental age of 2 years 7 months and an *IQ* of 79. When retested four months later, his mental age was 3 years 6 months and his *IQ* 100. (The retest was requested because of his improved social behavior.) Interest and attention were adequate on the first test and there was no undue hyperactivity or distractibility. The examiner thought his test adjustment was very good. On the second test he was enthusiastic, happy, compliant and attentive. He had improved in motor coördination, manual dexterity and visuo-motor coördination. Language comprehension and usage also were better.

f. Comment. Inasmuch as his test adjustment was good for the first test, it would seem that the test gave an adequate index of his functional level at that time. It is interesting to note that after four months at school he had lost many of his compulsive mannerisms, showed greater freedom in play, and his social adjustment had improved. He was able to test at a normal level, 21 points above the first test.

2. *Case 7—Girl—IQ Up 15 Points (97-116-112)*

Case 7 was an only child when she entered school. She was observed from 2 years 5 months to 5 years 1 month. A sibling was born during her first year at school.

a. Physical status. She was well developed, well nourished, and her health record was good—only a few absences for colds. Her appetite was good. Her coördination was very good.

b. Social background. The father was a professional man, absorbed in his work, but he had a warm personality and gave warmth and affection to the children in the necessarily short periods he could spend with them. Success had been rapid for him. He was handsome and outgoing, while his wife was shy and retiring. The maternal grandmother had been in a hospital for mental diseases for many years. The mother gave up her professional work when she married, and her interests centered exclusively upon her home life. She stressed cleanliness.

c. School adjustment, first year. The child was immediately well liked in the group. She took to school and routines easily. She was occasionally stubborn, but usually compliant. Her activity was purposeful. She was friendly, with occasional impulsive attempts at snatching other children's toys. By the end of the first year, she was considered a well adjusted child, outgoing, sociable, but extremely independent. At times she was fiercely possessive, and if other children objected to her taking their toys she pinched their faces. At the time her sibling was born, in the spring, she started to hide and hoard things. She had begun a few months earlier to be more resistive to sharing. She seemed to have no fear, except of her own aggression. She was sympathetic to the other children, and her anger was short-lived. During the first year, there were several difficult situations for the child: her mother went to a hospital for the birth of the second baby; her teacher was ill; a maid left; and the father, who was seldom absent from home, went away for several days. After the birth of the baby, the mother compared her unfavorably with the "good baby." In that period of several months she showed hostile, resentful behavior which, obviously, was related to the arrival of the baby. The only mannerism noted with some degree of frequency and intensity was thumb sucking, with associated nose rubbing, at nap time or when tired. She showed a mild tendency to excessive hand washing.

d. School adjustment, second year. At the beginning of the second year, her rapport was not as good with her own group, and she was aggressive and dominating. She often played alone, usually due to group choice. She always first said "no" to requests to share. Her aggressive behavior consisted in pushing, shouting, hitting, then dissolving into tears and asking the teacher for help. She was affectionate with her teacher, but pushed or hit other adults, usually to get their attention. Intermittently she was very gay, but resisted if spoken to about her attacks on adults. She had a confident, gleeful manner and a good sense of humor which helped to relieve tension. She continued to suck her thumb and tickle her nose with fuzz picked from her blanket. At this time, the ritual took on an additional significance and intensity, and if her "fuzz" could not be found she could not fall asleep until she had plucked more. The increased aggressiveness toward adults and resistance to routines were coincident with the early months of the baby brother, when the mother was absorbed in the infant's care. She continued aggressive, yet fairly sociable, through her second year at school.

e. School adjustment, third year. After eager arrival at school, she was energetic all day, except for occasional quiet moments of daydreaming. She was independent on less occasions than previously, being then defiant toward teachers and uncoöperative in group play. She had a keen sense of humor and frequently laughed gaily. She was not apprehensive but continued to show occasional anger by hitting, pushing, snatching. She was aggressive toward adults—this form of behavior reaching a peak during the spring and decreasing markedly toward the end of the school year. She continued verbally hostile toward adults. In the family, meanwhile, following a series of conferences between the mother and several members of the staff, including the psychiatrist, a reorientation was taking place. The mother focussed her attention on the child, freed herself, to a certain extent, from domestic chores, and sought much-needed diversion. Her demands upon the child were somewhat lessened. During her last (third) year at school, the child had a very good relation to her teacher.

f. Psychometric tests. At the age of 2 years 11 months, she had a mental age of 2 years 10 months and an *IQ* of 97. It should be noted that this test was made three weeks after the birth of her sibling. In the test situation she was willing, coöperative, and showed normal interest; she did not talk a great deal. The spread was only three levels. She found it difficult to string beads, and used a pencil in an infantile manner. At the age of 3 years 7 months, her mental age was 4 years 2 months, her *IQ* 116. She was willing, coöperative, friendly, and active all the time during this test. The spread was four levels. At the age of 3 years 8 months, her mental age was 5 years 3 months, her *IQ* 112. She was willing, friendly, and coöperated well, except when asked to use a pencil which she found difficult. The spread was again four levels.

g. Comment. It would seem that the second and third tests reflect her true mental ability more accurately than the first test, which was given shortly after the birth of her sibling. Her adjustment, at home and at school, showed a gradual improvement which has persisted during the two years since she left the nursery school. The results obtained in the first psychometric test, even though the child was coöperative in the test situation, are an index of the inner tension associated with the arrival of the sibling. At school, during the first year and the beginning of the second year, her relations to the other children—more than her relations to adults—presented some difficulty, as could be expected in a child working out his sibling relationship. Coincidentally, the intellectual functioning appeared lowest during the period in which the child's emotional security was, at least temporarily, threatened. Fundamentally, this is a well knit family and the parents (especially the mother) were quick to recognize and fill the need of this child for increased affection and reassurance.

3. *Case 9—Boy—IQ Up 31 Points (125-131-156)*

Case 9 (Boy) was an only child, who attended school from 2 years 0 months to 4 years 7 months.

a. Physical status. He was well developed, wiry and active. When first admitted, he was on a special diet for a poorly-defined gastro-intestinal condition; he was hungry most of the time. He was absent for colds 13½ per cent of the time the first year, and 22 per cent of the second year. He had frequent colds the third year, too; and, in addition, stayed at home one day a week to rest, at his mother's request. Usually he was more high-strung and irritable when he returned to school after his day of absence for rest than during the middle of the week. He alternated between periods of constipation and loose bowel movements, which was interpreted at school as an additional evidence of somatically-expressed tension.

b. Social background. The father had an older boy by a former marriage, and this boy had a closer relation to his stepmother than to his own mother. The father, a successful business man with intellectual drives, was restless and fond of sports. At home he was dominated by his wife, though more assertive in the business which they both conducted. The mother was a brilliant woman, formerly her husband's secretary and currently the chief executive in a scientific publishing firm owned by her husband. She had two years' psychiatric treatment, followed by six years' psychoanalytic treatment (two analysts—the first one committed suicide), a fact which was concealed at the time of admission. She had exhibited mild paranoid trends toward her former therapists, and she tended to reject any suggestions received at the school, yet carried them out later as if they were her own. There was friction between the mother and the child's nurse, principally over his enuresis. It was felt that there was considerable tension at home and that the mother rejected the child.

c. School adjustment, first year. He was happy, self-sufficient, independent, teased and hit occasionally but expressed most of his hostility verbally. Biting was a frequent reaction if something was taken from him; he then looked anxious and remained silent. He was afraid of heights. There were several infantile traits, such as immature speech (also a tendency to block and repeat syllables), thumb sucking, nail biting, tongue biting. He also had a relapse of bladder control after his nurse was discharged by the mother. At the end of the year, he continued to be independent, self-reliant, happy; he had become sociable, was well liked and sympathetic; he was adaptable, seldom angry, accepted frustrations well; he stopped biting other children. His stuttering was temporarily increased by an injury to his thumb and several minor injuries.

d. School adjustment, second year. During his second year, he was independent and friendly, though often unwilling to share one toy—usually the tank car or fire engine, which he monopolized. Occasionally he bit children, was quite tense and hyperactive. About the middle of the year, when he had an erratic, excitable nurse and his mother was more upset than usual (she had to go away for several weeks), the boy showed more tension and his stutter increased in severity; he became ambivalent toward his teacher. Again his stuttering was increased, *after Christmas, when he acquired a new nurse. Other factors were* operating: he had two substitute teachers, owing to the illness of his own teacher. In the spring, biting and genital handling were observed. The latter, noted briefly in the fall, had disappeared. He had more colds. At this point, since it was felt that his colds were to a large extent psychologically determined (absence of signs of infection, evidence of tensions at home), he was permitted to attend school, despite evidence of increased nasal secretion.

e. School adjustment, third year. He was a good-humored, eager, friendly, happy child. He stuttered only when excited, anxious or frustrated, in contrast to the more diffuse and severe stuttering of initial years. When angry, there was no trace of speech difficulty. He showed warm sympathy toward others; biting had ceased, but there still was mild genital handling through his clothes. If shown affection when excited, he quieted down quickly. The mother had taken over total care of the child—a delayed reaction to suggestions—and he enjoyed his mother's attention. Her contact with the school staff continued poor.

f. Psychometric tests. At the age of 2 years 4 months, he had a mental age of 2 years 11 months and an *IQ* of 125. At 3 years 3 months his mental age was 4 years 3½ months, his *IQ* 131. At 4 years 2 months, his mental age was 6 years 6 months, his *IQ* 156. In all three testing situations he was eager, friendly and coöperative.

g. Comment. In a child showing an increase of 31 *IQ* points in the course of three years' attendance at school, considerable improvement of emotional and social adjustment at school was noted. While the mother remained ambivalent and mildly paranoid, nevertheless she did make an effort to give more affection to the child; also, she removed an added cause of friction by taking over the child's care. The mother has shown the same mildly paranoid attitude toward the school which the child now attends, and it is probable that her attitudes are, on the whole, unchanged. The child visited the nursery school recently; he appeared happy and was free from stuttering. Repeated check-ups on this boy would be of great interest.

B. GROUP I, SUBGROUP (*b*): CASE 13, CASE 17, CASE 20

1. *Case 13—Boy—IQ Down 13 Points (157-144)*

Case 13 (Boy), an only child upon admission, was observed from 2 years 7 months to 4 years 5 months. A brother was born at the beginning of his second year at school.

a. Physical status. The child was somewhat undersized but wiry, muscular, with excellent motor coördination. He was absent 15 per cent of the time for colds the first year, 5 per cent the second year—a good health record. He was a small eater.

b. Social background. Both parents were brilliant, having been considered "prodigies" in school and college. The mother was aggressive, with intense cultural drives. She was aware of her ability and thought that she was brighter than her husband, who was prominent in his profession. She gave up her professional work when she married and was content to do specialized volunteer work (full time) in a hospital after a short period of training. She was concerned over the boy's precocity, having felt herself that being a "genius" was not necessarily conducive to happiness. There was tension between the mother and boy, which she related to his aggressiveness and precociousness. At the age of 2 years, he could cope with 3- and 4-year-olds verbally, and he was also physically aggressive. Prior to being admitted to Payne Whitney Nursery School, he was known to several mothers in park groups as a "biter." He was restless in bed, talking and singing instead of going to sleep. He ate with the maid. While his parents "idolized" him, they did not spend much time with him and there was no closeness of contact between parents and child. The mother seemed insecure in her relation to him and was awed by him.

c. School adjustment, first year. At first he was aggressive and very active but, eager to establish contact, he made friendly overtures to other children. On the whole, he made a rapid adjustment to the group. He paid little heed to strange adults but expected attention from and the approval of adults who were familiar to him. He reacted to frustration with hostile aggression and crying. He was also distrustful of unfamiliar children. His reaction to them was, to a degree, unpredictable; he would make impulsive friendly overtures to them or, on the contrary, bite them. He liked to be near others but often played alone. He was very sympathetic, except toward the object of his own attacks. He disliked sharing. He was emotionally volatile, changing in rapid succession from friendly to attacking behavior. Usually he preferred boys, though he also fought them more than girls. He had an extremely large vocabulary. His speech was very distinct, with a slight tendency to mild clonic stammering. He liked to play with words. There was spitting and mouthing, but finger sucking was never observed. Interest in food was moderate. He slept well at nap time. There was a little more than usual interest in genitals, his own and others', and he liked to compare his rather large penis to that of other boys; there was, however, comparatively little genital handling. He was afraid of the school turtles, stating that they would bite or scratch him with their "sharp claws." He was also afraid of snakes and dogs, and was very timid about climbing. He was not afraid of people. He was often afraid of his own aggression, staying near his teacher as he was on the verge of attacking another child.

In individual play sessions, there were many phantasies of power, such as Superman and similar entities, and such themes were often played out in the school group.

d. School adjustment, second year. A brother was born shortly after he returned to school (second year). He became distractible and very hostile, especially with younger members of the staff. Frequently he was also seen pursing his lips, as if he were trying to control his verbal aggressiveness. His relation to the children continued very much in the same vein, but a new theme was introduced in his play. He had never played with dolls; now he was prone to select a baby doll, play briefly with it and throw it away. Gradually, beginning with the middle of the second year, he became steadier, at home and at school. Also he was more coöperative with adults. There was less overt interest in genitals but considerable talk regarding the alimentary canal, with frequent references to food and what happened to it inside the body. Infantile traits practically disappeared; biting was observed only three times. There was more control of aggression; and his mother became more secure, since the child's biting had been of grave concern to her. She also spent more time with the boy, as a result of discussions with the staff and her own increased ease with the child. By the end of the second year, his fear of height had decreased. He was energetic, generally cheerful, and changed from serious moods to peals of laughter. He was coöperative, though he liked to tease and "trick" the teacher. There was better acceptance of strange adults. He was independent and self-reliant. He became protective of younger children at school. His leadership was respected, but he was not a good follower.

In individual play sessions, however, the child's adjustment did not reflect the same progress. There were indications that his acceptance of the sibling was not as smooth as would appear from the daily behavior records. Briefly, he rejected the interparental relation by referring generally to the parents as "big brothers" and "big sisters" rather than as father and mother. The parents in play were also engaged in frequent fights, the father being the more assaultive figure of the two. In the play sessions, the boy showed periods of excitement, during which he "danced a jig" (sexual in character) with the mother doll, then threw himself on top of the mother-figure on the floor. Finally, he showed marked hostility and destructiveness toward the baby doll identified as the brother. Because of the need for release of inner tensions, this child was given therapeutic help in the form of repeated play sessions; and his later adjustment at home and at school, as well as his intellectual performance in a somewhat rigid preparatory school, indicates that the rivalry about his sibling was resolved.

e. Psychometric tests. At the age of 2 years 11 months, he had a mental age of 4 years 7 months, and an *IQ* of 157. At 4 years 2 months (three months after the brother's birth) his mental age was 6 years, his *IQ* 144. During the first test, he was friendly, showed a high amount of interest, and his effort and attention were good. He enjoyed the test. The spread was five levels. He showed average motor function with superior language function and comprehension. Retention was average. During the second test, he was also eager to perform. He was coöperative and showed active interest throughout. There was a spread of four levels.

f. Comment. Although this boy seemed outwardly to have progressed in his social adjustment, his conflict regarding the arrival of a sibling was ascertained through the play medium and, despite the apparent adequate handling of the test items and good relation to the psychologist, it was reflected in his lowered intellectual performance. This observation is the more remarkable as, judging from his overt social behavior alone, one would be at a loss to explain the lowering of the intellectual performance.

2. *Case 17—Girl—IQ Down 16 Points (137-121)*

Case 17 (Girl), an only child upon admission, was observed from 2 years 8 months to 4 years 3 months. A sibling was born four months after admission.

a. Physical status. Her physical condition was excellent. However, she was absent for colds 19 per cent of the first year, 22 per cent the second year, which was among the highest incidence in her group. Large motor coördination was poor; she was slow in play and did not exhibit the eagerness and enthusiasm characteristic of young children.

b. Social background. Her father came from a family of culture and social prominence. The mother, having come from a rather modest background, had to be accepted in and live up to her husband's social position. There was a further adjustment to be made to religious differences—an important factor, as the father's family was deeply involved in religious culture and literature. In fact, the father's main interest outside of his work was writing about religious and philosophical subjects. A physical illness of several years' duration interrupted the mother's career—an experience very frustrating to her. The mother's drive for intellectual achievement was intense, and she expressed the fear that her children might fail to develop an interest in intellectual pursuits, or to get a college degree—as one member of her own family did. This prompted her to put undue pressure for learning on the child, even in preschool years. (She was disappointed, for instance, that reading was not taught in the older group.) The mother maintained a superficially friendly but somewhat defensive attitude toward the school staff. Fairly frequent contacts did not break down her resistances; significant biographical data, obtained from other sources, were withheld through five years of superficial relations with the school. Although the mother insisted on registering the second child at Payne Whitney Nursery School, it was felt that her attitude had remained critical of the excessive freedom and "lack of discipline" which she felt were prevalent there. Both parents were in the old-age group when their first child was born. A sibling was born about the middle of the child's first year at school, and a few days before her first psychometric test.

c. School adjustment, first year. She made superficial but friendly contacts with the other children. She seemed fairly happy, becoming excited and volatile when angry. She teased the other children persistently. Physical aggression was tentative and she was inhibited and fearful. When frustrated, she quivered with rage, showed verbal anger but could not allow herself to retaliate. Her speech expression was at first limited, but after a few months she became excessively talkative. She had a shrill voice, often whiney, and her speech articulation was immature, with many letter-sound substitutions and some repetitions. Grammar and vocabulary, on the other hand, were overdeveloped, and it was felt that the pressure at home for correct expression was responsible for the discrepancies in her speech and language development. Several mannerisms were observed (centered principally about the mouth), such as holding in her mouth food which later she would defiantly spit out; nail biting, later replaced by nose picking. She also twisted a lock of hair as she bit her nails; she chewed on her clothes whenever she was not at ease in a play situation; her eyes blinked; she was self-conscious in the presence of adults. Inner tension was further evidenced in her inability to relax and fall asleep at nap time—a fact so disturbing to the mother that daily she bribed and threatened the child as a means of "coaxing" her to sleep.

Individual play sessions revealed considerable repressed hostility toward the mother and sibling.

d. School adjustment, second year. She was friendly and popular with the children in her own group. Aggression was still verbal and she was apprehensive when the other children made aggressive gestures toward her. She would become tense, her face flushed with anger. It was obvious that she had difficulty in releasing her feelings; she clung to familiar play, and wanted to be reassured about new play ideas. She continued to tease adults and children, sometimes bringing the children to tears and then complaining about them. What she seemed to fear most was her own aggression. Lisping and a few consonant substitutions were still present. She also continued to suck her fingers, to chew and twist her hair; but the holding of food in her mouth had almost disappeared. Genital handling was observed during the last few weeks, at nap time. The mother reported conflict at home (over eating and sleeping) between herself and the child. There was less imitative behavior, and she became slightly more aggressive and self-assertive toward the end of her second year.

e. Psychometric tests. At the age of 3 years 2 months, she had a mental age of 4 years 4 months and an *IQ* of 137. At 3 years 11 months, her mental age was 4 years 9 months, her *IQ* 121. In the first test, she needed some encouragement to go to the examining room; then she was at ease and coöperative, but she wanted to leave whenever the items became difficult. During the second test, she was willing and coöperative but not demonstrative or friendly; she tended to draw back if the examiner came close to her. She said very quickly at times, "I don't know," and the examiner felt that she may not have done her best. Her memory was good. The spread on each test was five levels, but the second test showed more regularity of performance.

f. Comment. While the child's adjustment at school showed a slight progress and a tendency toward self-assertiveness, at no time was she free from tension. The individual play sessions pointed to the presence of hostility toward both the mother and the sibling. Pressure on the part of the mother continued, in fact it was further emphasized by the arrival of the sibling; and it is reasonable to assume that the lowering of intellectual performance is related to the internal tensions evidenced at home and at school, especially demonstrable in the individual play sessions.

3. *Case 20—Girl—IQ Down 16 Points (155-141-139)*

Case 20 was the younger of two children, upon admission. She is the sister of Case 3 (page 11). A third child was born between her first and seconds years at school. She was observed from 2 years 4 months to 4 years 11 months.

a. Physical status. She was a well developed, well nourished child with a very good health record—absence for colds, 11 per cent of the first year, 5 per cent the second year; no other absences.

b. Social background. The father, who was in his middle forties when this child was born, had been married previously and had several considerably older daughters by his first wife. The first years of this second marriage were not very easy, as the mother had a conflict over her mother-career-woman status. Considerable work was done with the mother about the adjustment difficulties of the first child, who also attended Payne Whitney Nursery School. In shifting the emphasis on the older child's problem, the emotional needs of this second child were, to a certain extent, overlooked; on the other hand, she benefitted from the mother's increased insight.

c. School adjustment, first year. She was a vivacious, gay, independent child with an almost constant smiling expression. She also hit, slapped, and bit swiftly, later showing concern over what she had done —a typically ambivalent attitude of the young child. She tended to be self-conscious before adults. She liked to be cuddled by her teacher, then would suddenly slap her. Also, she frequently used "name-calling" as a weapon of hostility. She usually played with *one* boy. Several "mannerisms" were noted, such as nose picking, sucking three fingers (in a complex pattern exactly reproducing that of her older sibling), licking the lower lip, holding the mouth open. Her vocabulary was small, her articulation somewhat immature, but she spoke freely. *Much of her speech was patterned after that of her sister, especially* with regard to pitch and modulation. She used words frequently for the enjoyment of phonetics, which the other children infectiously picked up from her. She was adaptable, could "take or leave" the group. She was an active, aggressive, well adjusted child. Aggression (pinching, biting, hair-pulling) was used in retaliation rather than in attack. During her first year, she developed a large vocabulary. There was a transitory period of stuttering—not unusual at that age, when there is speech pressure not commensurate with speech development. A third baby was born at the end of the first school year and the mother became absorbed in the new-born, which she reported as a typical *pattern with her; past the babyhood stage, children were less attractive* to her. Her nurse, who had been with her since birth and who showed considerable affection for her, left shortly after the birth of the third child.

d. School adjustment, second year. She was well liked and sure of her position with children. Quickly angered, she also recovered quickly. She was alternately clinging and hostile to her teacher. While generous with her own toys, she occasionally hoarded all available toys. There was a good deal of competition between her and her older sister who insisted that the baby was her own. At home and at school, Case 20 alternated between trying to be "big" like her sister or "little" like the baby. *Coincident with the birth of her sibling, she* showed some regressive behavior; for instance, she clung to her mother, demanding to be fed by her while sitting on her lap; and she engaged in "baby" play, at home and at school. She had been the favorite child, but with the arrival of the third child parental interest and affection were shifted away from her. The beginning of her second year at school was thus marked by three significant events: (*a*) the birth of the baby; (*b*) the loss of her own nurse; (*c*) her teacher's absence for six weeks, because of illness. By the end of her second year, she had gradually become friendly, cooperative, dominating, a group leader. The children in her group followed her play ideas implicitly. There still was alternate clinging and resistance toward her teacher. Gradually she become proud and fond of the baby. There was, however, a short period of overt hostility toward the baby and the children in her group, when her parents and older sibling went away for two weeks. During this time, when she was left with the baby and the baby's nursemaid, there was a keen competitive drive manifested in her group relationships.

The individual play sessions indicated her conflict over the baby and her hostility toward her.

e. School adjustment, third year. During her third year, the child continued somewhat absorbed in the baby's life at home and was frequently reluctant to come to school. The initial reluctance notwithstanding, each day she adjusted well to the group; she continued friendly, active, and a leader. In the spring, she was teasingly resistant to her teacher. However, on the whole, her adjustment at school was good.

f. Psychometric tests. At the age of 2 years 9 months, her mental age was 4 years 3 months, and her *IQ* 155. At 3 years 10 months she had a mental age of 5 years 5 months, and an *IQ* of 141. At the age of 4 years 8 months, her mental age was 6 years 6 months, and her *IQ* 139. During the first test, she was willing, friendly, coöperative. Her rapport was good. Her attention wandered at first, but after she started a task she worked with great concentration. Motor coördination was fair; she tended to fail motor, rather than verbal, tasks. The spread was six levels. During the second test, she was willing, friendly, coöperative, and her rapport was good. She wanted to succeed. Often she asked for reassurance. She would not readily admit that she did not know the answer. The spread was four levels. During the third test, she was well poised and concentrated well. She said she thought that she would do better this time, because now she was four years old. There was a spread of only three levels.

g. Comment. There is a close parallel between this child's social-emotional adjustment and her intellectual and motor performance in the three successive psychometric tests. She is a happy, well integrated child, well able to deal with frustrations. Her adjustment was very good the following year, when she attended kindergarten, and her superior school achievements there (also, she was the most successful and popular in her group) indicate that she has returned to her first level of intellectual function. (No test given.) The *IQ* drop during her second and third years at Payne Whitney Nursery School could be anticipated on the basis of biographical data as reported above.

C. Group II: Case 23, Case 27, Case 35

1. *Case 23—Boy—IQ Down 9 Points (128-120-119)*

Case 23 (Boy) was an only child during his three years' attendance at Payne Whitney Nursery School from 2 years to 4 years 7 months.

a. Physical status. He was a well developed, well nourished child with a fairly good motor coördination. He had frequent colds, for which he was absent 25 per cent the first year, 9 per cent the second year, and 35 per cent the third year. During the third year he had also an unexplained temperature over a period of several weeks.

b. Social background. Both parents were adopted children. The father was a young, immature individual who preferred the company of his fellow students in the professional school he attended to the background and responsibilities of home life. Sexual adjustment was poor. The mother, also young, was withdrawn and appeared unhappy. She had not been well adjusted to her adopted parents and entered marriage as a means of escaping from home. During the child's third year at school, she became attached to another man. There was a pregnancy, followed by abortion, and shortly afterwards a second pregnancy, followed by the birth of a sibling. The latter seems to have caused all plans for divorce and remarriage to fall through. Later developments, several years after the child left Payne Whitney Nursery School, were increasingly traumatic to this boy, but there had been continuous tension and unhappiness in the intervening period.

c. School adjustment, first year. The child was friendly and gregarious, but also showed impulsive, aggressive behavior, hitting, kicking, biting; he also had tantrums; and thumb sucking and genital handling were observed at times of stress. His mother had taught him to bite himself when he felt like biting others, and some days his wrists and hands were covered with small bite marks. While he was frequently tense and easily excited, he was also cheerful, enthusiastic, active and independent. He was very possessive of his toys.

d. School adjustment, second year. During the second year, he continued to be tense at times of frustration. He showed hostility toward everyone at one time or another. Less verbally hostile than during the previous year, he was not able to express his feelings very readily, often only glaring at a child or adult. He showed quick changes from friendly to hostile attitudes. A leader in his group, he was friendly with the other children but tended to be "bossy." He was extremely possessive but gradually, toward the second part of the year, he began to share his toys. There were no outstanding fears, but occasionally apprehensiveness was manifested, as well as a lack of eagerness to enter new situations. He had a good sense of humor.

e. School adjustment, third year. Between his second and third years, this child came very close to dying by drowning—unconscious for several hours. He was pulled out of the water by a dog. No fear of water was indicated, and there was no apparent increase in apprehensiveness. During the last year at school he became more stable, accepted frustrations more readily. There were still occasional mild outbursts of temper; he was still possessive of toys, and mildly tense; and there still was more ambivalence of feeling than is generally the case in that age group. However, he became more demonstrative with his teacher. He also accepted affection from one boy with whom he was "the baby," while at the same time he was, to the group, a leader. He was the most popular child in this group, a physically attractive, gay, responsive youngster. He greeted strange adults with threats, spitting, etc. He could not relax at nap time; in fact, he was disturbing to other children, and for that reason he was placed in a room with two other children, even then continuing for a long period to be restless and talkative. Gradually, toward the end of the year, he was able to be quiet after a few minutes. On the whole, in the course of three years' attendance, there was a lessening of tension at school.

In individual play sessions, however, there was noted through the years an undercurrent of anxiety, in phantasies, dreams, play (fear of destruction, dirt) and a fairly overt expression of hostility toward both parents. It was never possible, in this case, to reach the parents except for superficial school contacts. Later, psychiatric help was sought by the mother when an acute conflict developed about the marital relations, as referred to previously.

f. Psychometric tests. At the age of 2 years 2 months, the child's mental age was 2 years 8 months, and his *IQ* 128. When he was 3 years 4 months, his mental age was 4 years, his *IQ* 120. At 4 years 4 months, his mental age was 5 years 2 months, his *IQ* 119. During the first test, he was interested in the items and seemed to enjoy them; and he was coöperative. Motor ability was not so well developed as other functions. The spread was six levels. During the second test, he was interested, spontaneous, happy, somewhat overactive in the test situation. His attention span seemed rather short. Excellent progress had been made in motor ability since the first test. The spread was only three levels. During the third test, which had a spread of five levels, he was willing and very coöperative, his attention was good and his interest high. He failed all drawing tests. He showed fair motor control but poor form perception.

g. Comment. The school reports show continued tension but good progress in social adjustment during three years' attendance. The test results did not reflect improvement; there was a net loss of 9 *IQ* points—not considered a significant drop, as arbitrarily defined above. This child was insecure in his home, and his inner tensions were mainly reflected in his phantasy life and continued anxiety. Since the home conditions did not improve—in fact, later they were considerably more threatening to this boy—it is highly probable that the insecurity reflected in the relative inhibition of intellectual functioning has continued.

2. *Case 27—Boy—No change in IQ (125-125)*

Case 27 was the older of two children upon admission (the sibling—Case 35, Girl—was 1 year old). He was observed from 3 years 5 months to 4 years 10 months.

a. Physical status. He was a well developed, well nourished child. His large and small motor coördinations were superior. He was absent for colds 28 per cent of the first year and over 15 per cent the second year, with an otherwise excellent health record.

b. Social background. Neither parent was very communicative, but both were warm and demonstrative toward the children. They were not unfriendly, but their apparent reserve was often felt by other parents as a source of strain. The father was a professional man, absorbed in his work, with very few outside interests; there was a nice sense of unity in the family.

c. School adjustment, first year. Upon admission, he made such an easy adjustment to school life that on the first day the teacher entered a note to the effect that she was hardly aware of him as a new child. He was happy, poised and self-reliant, an energetic and enthusiastic participant in group and independent play. He was sympathetic toward the other children, enjoyed their company but was not entirely dependent on them. In his own group, he soon became a leader without overly-aggressive attitudes. On the apparatus, he was casual, fearless, efficient. There was some possessiveness regarding toys, but not abnormally so. There were no infantile habits other than occasional nail biting and nose picking. Rare and short-lived temper tantrums occurred when he became severely frustrated. He was indifferent to strange adults, but had a good relation to the school staff and was very close to his own teacher. In short, he was a very well adjusted child.

Individual play sessions brought out occasional anxiety dreams of biting animals, and mild hostility towards his family—frequently found in the dream and phantasy life of young normal children.

d. School adjustment, second year. The child continued to be independent, adaptable and happy, both as a follower and leader. He usually settled any quarrel that came up by laughing, thus breaking the tension. Anger, as a rule, was short-lived. He was occasionally stubborn—usually when tired. He was quite social and friendly, with a preference for boys. He was secure at home and at school. There were no fears. Fairly infrequent nail biting continued.

Mild anxiety in dreams and phantasies was expressed in individual play sessions—all within normal limits.

e. Psychometric tests. At the age of 3 years 8 months, he had a mental age of 4 years 7 months, and an *IQ* of 125. At 4 years 8 months, his mental age was 5 years 10 months, and his *IQ* 125. During the first test, he showed active interest. He was compliant but refused one item. His mood was happy and there was no restlessness. The spread was only three levels. During the second test, he was friendly, coöperative and enjoyed the test. The spread was only two levels.

f. Comment. One would not expect *IQ* changes in such a consistently well adjusted child, and the results obtained in the two tests bear out this expectation.

3. *Case 35—Girl—IQ Down 5 Points (136-131)*

Case 35, younger sister of Case 27 (page 31), was the second of three children. The youngest (a boy) was born four weeks after she entered school. She was observed from 3 years 9 months to 5 years 4 months.

a. Physical status. She was well nourished. Motor coördination was exceptionally good. Her health record was among the best at the school.

b. Social background. Her background was the same as that of Case 27. The mother preferred the boys and complained of the mild resistive attitude of this child. The child had a good relation to her older brother and tended to imitate him. She frequently quoted him, and they played together constantly. The father reported that the girl was not jealous of the new baby but "it took her a little while to get used to him." At the time of the sibling's birth, her room was given up to him and his new nurse, her bed being placed in the older brother's room.

c. School adjustment, first year. She accepted school easily. She seemed happy there and sympathetic toward others. However, she craved attention, was jealous when it was given to others in her group, and showed anxiety when she felt neglected. She was strongly possessive but able to share if approached in a friendly way. There was a short period in the spring when she was jealous of the baby and needed reassurance from her parents. At this time she also showed some hostility toward her teacher. Her hostile reaction toward the baby was considered normal, and her ability to express her feelings freely was considered healthy. She tended occasionally to be "bossy" toward, and to tease, the younger children. There were three periods of touchy, uneven behavior during the year, corresponding to developments in the baby's life which brought the attention of the family to the infant. Coincidentally with this behavior, she craved more attention from teachers and children at school, she indulged in play themes in which she was the baby, and resented the attempts of other children to play this rôle. She became hostile toward the baby's nurse. There were a few mild mannerisms, such as thumb sucking before sleeping-time, nose picking, and occasional biting. When thwarted, she hit, scratched and screamed. The summer was a more gratifying period, as the mother—following the staff's suggestions—centered her interests on this child, while the nurse busied herself with the two boys. At the end of the first year she had become friendly, happy and eager. Her rapport with her teacher was good.

Individual play sessions revealed sibling rivalry.

d. School adjustment, second year. The child was friendly, playful, independent. She showed great freedom in her emotional expression. She was a leader, yet could participate in group play, or play alone happily. She was a popular child, did not tease younger children—as was her tendency during the first year. She was never anxious about new situations, in fact she enjoyed changes in routines. There was, in mid-year, a phase of resistance to all routines, both at school and at home—cause unknown. She was direct and purposeful in her play and there was little phantasy. On the whole as compared with the end of the first school year, there was no conspicuous change in social behavior; but minor changes took place that were in the direction of improvement. Her teasing and "bossy" manner had disappeared but, the mother reported, she was domineering at home during the latter part of her second year. The mother acknowledged her own preference for the boys, and there is still mild friction between mother and daughter.

Individual play sessions continued to show dreams and phantasies related to the gradually resolving sibling conflict (dreams that he might fall out of bed, etc.).

e. Psychometric tests. When she was 3 years 11 months, she had a mental age of 5 years 4 months, and an *IQ* of 136. At 4 years 10 months, *her mental age was 6 years 4 months, her IQ 131. During the* first test she was willing, friendly and coöperative. Her rapport was good, the test was consistent, and the spread was four levels. During the second test she was again friendly, willing and coöperative. She chewed a pencil much of the time, and seemed to find it necessary to keep her hands occupied constantly. Again the spread was four levels.

f. Comment. In this well adjusted child there was no conspicuous change in behavior. The family is well knit, and the children are given a great deal of affection. The sibling rivalry and conflict were partly resolved and partly repressed, with the relation to the baby increasingly satisfactory. For the three years following her attendance at Payne Whitney Nursery School, this child has made an excellent adjustment at home and at school, and her performance in the latter situation indicates that intellectual function continues at a high level. The parallelism between emotional adjustment and intellectual function is close, with steadiness as a characteristic of both.

V. ANALYSIS OF PSYCHOMETRIC REPORTS

Eighty-eight Stanford-Binet tests (1937 revision) administered by four psychologists from 1937 through 1943 were used for this study. They have been analyzed for inconsistencies in test performance, relation of excessive or constricted spread to *IQ* variations, shifts in basal ages, and failures, to see what kinds of failures were made at the level just above the basal age by this group of 39 nursery school children with two or three psychometric tests.

The 88 tests comprise 74 Form *L* (84 per cent) and 14 Form *M* (16 per cent), distributed as follows:

First test	34 Form *L*	5 Form *M*
Second test	30 Form *L*	9 Form *M*
Third test	10 Form *L*	

The interval between tests ranged from three to 16 months on 38 children; one retest was given 26 months after first testing. There were two tests on 29 children; three tests on 10 children. The spread is given in Table 1.

TABLE 1
TABLE OF SPREAD—39 CASES, 88 TESTS

Number of levels	1st test	2nd test	3rd test
Two	2	3	—
Three	4	5	4
Four	13	15	1
Five	9	7	3
Six	7	3	2
Seven	4	4	—
Eight	—	2	—
Totals	39	39	10

A. CHARACTERISTICS OF GROUP I AND GROUP II

Group I—22 children with changes of 10 or more IQ points on retest.

Mean *IQ* on first test 121.8, range 79[1]-157.

Mean *IQ* on second test (3 to 20 months later) 121.9, range 100-154.

Fourteen cases gained 1-21 *IQ* points, average (mean) gain 12.7; 8 cases lost 12-21 *IQ* points, mean loss 15.5.

On third test, available on 8 cases and given from 9 to 17 months after second test, 4 gained 2, 10, 16 and 25 points respectively; 4 lost 2, 4, 14 and 14 points respectively.

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[1] As explained earlier, this child with initial *IQ* of 79 was accepted before research standards were established. It was considered desirable to include him in this writing because of his increase of 21 *IQ* points after three months of school attendance. Mean *IQ* of Group I with this *IQ* of 79 omitted would be 123.4.

Group II—17 children with variation of 0-9 IQ points on retest.

Mean *IQ* on first test 120.8, range 96.142.

Mean *IQ* on second test 121.3, range 100-145.

(Second test given after intervals of 5-14 months on all except one, on which the interval was 26 months); 8 cases gained 1-9 *IQ* points on retest, mean gain 4.2; 8 cases lost 1-10 *IQ* points,[3] mean loss 5.4; 1 case showed no change.

On third test, available on only 2 cases in this group and given 12 and 15 months respectively after second testing, each lost 1 *IQ* point.

1. *Excessive Spread*

Nine children had spreads of seven and eight levels, one on two tests. Retest scores on three of these varied only slightly; one gained 9 points and five showed marked changes; one lost 12 points, one lost 25 points and later regained 16 points; three gained 21, 22 and 31 points respectively. Thus wide spread in this group appears to be related to some extent to marked variation in score.

2. *Marked Change in Spread*

Twenty-three children showed a difference of only one or two levels of spread on retest and eight cases showed no change in spread. However, the remaining eight cases showed the following wide variations:

Three cases increased spread on retest by three levels—

Case 1 (Boy) (page 11) initially had two levels of spread. Three months later his spread was five levels and he gained 21 *IQ* points (79-100).

Case 2 (Boy) (page 11) with two levels on his first test, five levels a year later, gained 16 *IQ* points (90-106).[2]

Case 38 (Girl) (page 15) shifted from four to seven levels when retested in nine months and lost 4 points (122-118).

Three cases reduced their spread by three levels—

Case 11 (Boy) (page 11) decreased spread from seven to four levels, gained 21 points (123-44).

Case 23 (Boy) (page 13) decreased spread from six to three levels and lost 8 points on second test; on third test his spread was five levels and he lost 1 point (128-120-119).

Case 5 (Girl) (page 11) decreased spread from five to two levels, gained 10 points (111-121).

One Case 10 (Boy) (page 11) decreased his spread by four levels, from seven to three, and gained 22 points (110-132).

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[3] A third test was available on the case which lost 10 points on the second test; part of the loss was regained. As net change was less than 10 points, he was included in Group II.

One Case 9 (Boy) (page 11) increased his spread by five levels, from three to eight, and gained 6 points on the second test; on the third test with five levels of spread he gained 25 points (125-131-156).

3. *Constricted Spread*

Sixteen tests showed only two or three levels of spread, and the question arose as to whether something interfered with free intellectual function at these times. The examiner's reports indicate that the children were coöperative and willing to be tested. Examination of these sixteen tests showed that two children showed no change in *IQ* with the restricted spread; four gained 1-22 *IQ* points, three more than 10 points; but 10 children lost from 3-21 points, six of them more than 10 points. *Thus the IQ of 56 per cent of the sixteen varied markedly with narrow spread, and the IQ of 63 per cent of this group was lowered.*

4. *Inconsistent Test Patterns*

Eight children failed on retest items that they had passed previously. Four dropped in *IQ*, three markedly so; four gained, one markedly so. Again, the psychologist stated in the test report that the child was "coöperative and willing" during the testing. Whether inner tensions or anxiety were operative at these times, in spite of apparent coöperation and alertness, cannot be definitely determined.

5. *Basal Age Shifts*

Frequently, children in our group jumped several basal levels on retest, sooner than a corresponding degree of mental growth could be expected even for superior children. Only one child in the group with insignificant *IQ* changes showed this marked shift in basals and gained only one *IQ* point.

TABLE 2

FAILED ITEMS GROUPED ACCORDING TO CLASS

Class of items	Frequency of failure	No. of items in class	Equated value	Rank
Memory for digits	23	4	258.75	1
Memory items except digits	11	4	123.75	2
Comprehension	18	7	115.74	3
General knowledge	23	9	115.00	4
Form discrimination	12	5	108.00	5
Vocabulary	14	6	105.00	6
Manual dexterity	13	6	97.50	7
Number usage	7	4	78.50	8
	121	45		

But eleven Group I children showed such shifts, nine of them gaining from 9-25 *IQ* points and two losing 12 and 14 points respectively. Thus it would appear that even the child's basal level may be indicative of his mental organization at the time he is tested, the higher basals giving more compact tests (not necessarily with constricted spread) and often showing substantially higher *IQ* scores over the tests with wider spread and much lower basal on the same child.

6. *Failure Analysis*

As this group has a mean *IQ* above 120, its pattern of failures may not be like that of an average group. The 88 tests were analyzed for failures at the level just above the basal. One hundred twenty-one items at levels II-6 to VII appeared. Basals ranged from II to VI, passing performances from II to VIII. The one hundred twenty-one items are grouped below into eight classes of items which may be related in the sense that they appear to measure the same or somewhat similar mental functions. The classes have been equated for item frequency.

It will be seen from Table 2 that judged by equated value, digit memory failures account for the largest percentage (19.2 per cent) of failures in any one group of items; and that adding together failures on all memory items accounts for 28.3 per cent of the failed items.

Bearing in mind that, as noted above, wide spread and marked shifts in basal age both appeared more frequently in the test records of children in Group I, it may be interesting to note the following further analysis of the 121 items failed at the level just above the basal. Little attempt is made to attach meanings to the figures below because it is obviously impossible to compare 74 items failed by 22 children on 52 tests including eight third tests (Group I) with 47 failures made by 17 children on 36 tests including two third tests (Group II); therefore, any comment of an interpretative nature is merely suggestive. The 121 failed items can be broken down as indicated in Table 3.

The 19 items in the last column were failed by children in Group II who had *IQ* variations of 7-9 points on retest and a history of tension and instability. From these figures it will be seen that actually only 28 (47 minus 19) of the 121 items were failed by children whose histories reflected good emotional adjustment and whose *IQ*'s varied less than 7 points on retest. The figures on memory items suggest that even temporarily upset children fail memory items much more frequently than children who are more stable. Since attention is an important factor in immediate recall as well as in fixating

TABLE 3

	Failed by Group I	Failed by Group II	Failed by Group II children who showed some *IQ* variation plus tension or instability
Memory for digits	17	6	4
Memory items except digits	7	4	1
Comprehension	14	4	—
General knowledge	12	11	3
Form discrimination	8	4	2
Vocabulary	6	8	4
Manual dexterity	7	6	3
Number usage	3	4	2
	—	—	—
Totals	74	47	19

material for later recall, one might reason that attention is not optimum when children are emotionally disturbed and that this results in frequent failure of memory items on intelligence tests.

B. Summary of Psychometric Analysis

The 39 children used for this study were divided into two groups: Group I, 22 children with a mean *IQ* on first test of 121.8, range 79-157, whose *IQ* changed 10 or more points on retest; and Group II, 17 children with a mean *IQ* on first test of 120.8, range 96-142, whose *IQ*'s varied less than 10 points on retest. The number of cases used in this study is too small to consider the statistical significance of similarities or differences of groups, but a brief summary of the findings outlined above suggests that for these children, at least, wide spread is related to significant *IQ* changes; of eight marked changes in spread, all but one showed marked variations in *IQ* on retest; of 16 tests showing constricted spread, nine showed marked changes in *IQ* on retest; of eight inconsistent test patterns where children failed items previously passed by them, five had marked *IQ* changes on retest; of 12 children with marked basal shifts on retest, 11 showed significant gains or losses in *IQ*, and analysis of items failed just above the basal level showed that most memory and comprehension test items were failed by children in Group I (the group with significant *IQ* changes on retest).

VI. SURVEY OF LITERATURE

A survey of the literature during the past five years yields little specific information on the relation of intelligence and emotional adjustment but a number of studies refer to emotional conditions or events as possible factors in test scores. Blanchard (5), in stressing caution in the use of psychological test results in diagnosis and prognosis, says "the personality and emotional state of the child may effect the rating." Allan and Young (1) state that marked variations in *IQ* seem to be influenced "by such factors as insecurity attending the loss of a parent, by frequent or recent changes in the home, by conflict in the home, by treatment which engendered lack of self-confidence and prolonged immaturity, by unusual changes in educational opportunities, and by poor health." Brown (6) finds the *IQ* to be constant but concedes that individual variations occur as a consequence of emotional blocking during the test. Hallowell (23) believes that 10 per cent of the changes of 10 or more *IQ* points in his group were due to "emotional factors" and 25 per cent to "environmental situations." Goodenough (20) mentions the need to direct a child's activity into mentally healthful channels, if his intelligence is to become an asset. Dulsky (10) reports on 13 cases after they had received an average of 15 months of play therapy: eight gained in *IQ* on retest, four significantly; five lost in *IQ*. When he retested eight cases a third time, with an interval of a year between second and third tests, little change in *IQ* was found.

Lund (27) writes of the interdependence of intelligence and emotionality. He points out that although we speak of the central nervous system and autonomic nervous system separately for convenience, they do not function separately and that the emotions "may not only give direction to mental content but may also affect the quality and level of performance." He cites the wide variations in mental and physical output associated with the manic-depressive psychoses, melancholia, and schizophrenia. "That variations in alertness and mental capacity under these conditions depend upon fundamental changes within the autonomic system is seen from studies in metabolic rate and bodily tonus characterizing these forms of disorder."

Richards (33), in a longitudinal study of 80 children tested at six-month intervals from the age of 6 months during periods from four to ten years, attempts to link home incidents to *IQ* variations and concludes that there were significant differences in the kinds of homes of those who showed consistent *IQ* gains and those who did not—differences in respect to the amount of "solicitousness, accelerational attempt, and severity of disciplinary penalties" shown by the mother.

Goldfarb (14) presented evidence of the effects of deprivation caused by institutional life in infancy on emotional and intellectual growth. He compared 15 children who had had an average of three years and three months of institutional care before being placed in foster homes, with 15 children placed in foster homes soon after leaving their own families. Those who spent their infancy in an institution were found to be retarded intellectually and emotionally, and they presented more frequent and more serious behavior problems than the other group. Goldfarb (16) reported that the Rorschach data on this group of institution children showed that their intellectual development was behind that of the "family" children. An article on the same group by Goldfarb and Klopfer (17) further emphasized what they call the "deleterious and permanent effects on personality of extreme psychological deprivation of infants" in institutional life. A later study by Goldfarb (15) of 40 children with about three years in an infant institution before foster home placement showed that these children presented intellectual and emotional problems necessitating repeated home placements to a much greater extent than was the case with children reared from infancy in families.

Street (41), in his work with 920 exceptional children, found that those who gained 10 or more points on retest were often shy, fearful and verbally inarticulate on the initial test; but not all children exhibiting these traits initially made substantial gains on retest.

Schafer (34), in a study of scatter, by which he refers to the "disharmony of efficiency of mental functions as indicated by differences between subtest scores," tested mentally ill patients with the Babcock Efficiency test and reports the disturbing and distorting affects of emotions and attitudes which destroy the "relative autonomy" of intellectual function. Schafer and Rapaport (35) studied scatter with the Wechsler-Bellevue subtests on mentally ill subjects and describe the uneven mental functioning of various clinical groups.

Regarding the effect of nursery school training on intelligence, Anderson (2), Bird (4), Goodenough and Maurer (21, 22), Jones and Jorgensen (24), Lamson (26), and Voas (43) report that nursery school training does not increase the *IQ*. Frandsen and Barlow (13) and Page (30) report slight insignificant gains. Goodenough (18), McNemar (29), and Simpson (36, 37) criticize the methods used in the Iowa studies, believing that the results reported are affected by the selection of cases, the statistical methods chosen, and the tendency to credit *IQ* gains to nursery school training without adequately measuring other operative factors. Wellman, Skeels, and Skodak (45) reject McNemar's criticisms of their statistical methods as largely irrelevant. Wellman (44) reports the *IQ* to be functional, directly affected by educational experiences inside and outside of school, and considers the type of school an important factor in the growth of intelligence. Starkweather and Roberts (38) corroborate the findings of earlier Iowa studies that nursery school training increases the *IQ*. Stoddard (39) answered critics that Iowa has studied many more cases than are reported by other studies, and also that most of the studies which claim no benefit to the *IQ* from nursery school training, do, nevertheless, report a small gain in *IQ* on the part of nursery school children over the control groups used. He states that the belief that the *IQ* remains constant is giving way before the findings of Burks, R. L. Thorndike (42), Honzik and others. Stoddard (40) cites the great need for studies which will demonstrate the influence of biological and social factors, bad health, and "mental rigidity in the Lewinian sense" on intelligence. Allan and Young (1) believe that constancy varies according to the criteria used. Katz (25) found his test-retest correlations to decrease as the interval between tests increased. Brown (6) believes the *IQ* to be constant within a very narrow range as long as the child's environment is relatively constant. English and Killian (11) say that it is "extremely difficult" to modify the *IQ*. Hallowell (23) studied 250 children from infancy through three years of age and reports validity correlations on the *IQ* very similar to those reported for older and school-age children. He states that mean variations are related to age, reporting 15 *IQ* points for his group under one year of decreasing to 8 points at three years of age. Fleming (12) studied the subtests on Forms *L* and *M* of the Terman revision of the Stanford-Binet Scale, and finds the tests at Years III to IX to be equal in difficulty on the two forms. Goodenough (19) finds variability on the 1937 revision to be lowest at age 6 and highest at 2½ to 3 and probably at 12, particularly with children ranking 2-3 *SD* above or below the mean of their group. One can expect changes from 8 to 12 *IQ* points on these latter.

VII. DISCUSSION

As indicated above, in the brief survey of the psychological literature, diversified opinions are expressed regarding the variability and non-variability of the intelligence quotient. When variability is recognized, the majority of authors tend to account for it through unknown or extraneous factors. However, a few authors trace variations in intellectual function to emotional disturbances. In the psychiatric literature there has long been a recognition of gross intellectual deterioration in syndromes involving severe personality disorganization.

There are few systematic studies of children of preschool age in which dynamic studies were possible, with variables reduced to a minimum. A commonly reported cause for variability in the case of young children is that the children were not tested under uniform conditions by the same psychologist. As described above, psychometric tests are given at the Payne Whitney Nursery School under favorable conditions and extensive biographical data are obtained. Nevertheless, repeated tests indicate variations in intellectual performance which cannot be ascribed to the test situation. Incidentally, the factor of physical illness is removed, since no child is ever tested if his health is, for any reason, below par.

In the test situation itself, a number of factors must be taken into consideration for an adequate evaluation of the results. Some pertain to intellectual function while others do not, except as they indirectly affect intellectual functioning in that situation. Even in blind testing, the examiner would make observations on the behavior of the child; but without biographical data, he would be unable to state whether the child's mood, for instance, was habitual or exceptional—related, perhaps, to some recent incident. He would not know whether the child's contact with him was typical of his contact with the majority of adults or a reaction to himself alone (to the child, an unknown adult). Rapport and coöperation are generally reported upon by all testing psychologists, although with varying degrees of insight depending upon their own training and personality. As for intellectual performance in the test, the interest and concentration of the child are usually observable and can be reported upon relatively accurately. The test scoring is done by means of more or less rigid rules which do not take individual personality patterns into consideration.

It is highly probable that neglect of these factors explains in part the state of confusion which prevails in the literature. Such titles as the following reflect that confusion: *"Constancy of the Intelligence Quotient . . ."; "Does the IQ wander?"; "The Wandering IQ"; "The Fickle IQ."*

In the Payne Whitney Nursery School records, one cannot fail to be impressed with the highly individual character of the variations and their relation to the child's emotional adjustment. In 22 out of 39 children, significant changes ranging from 10 to 31 points, up or down, under favorable conditions for testing were recorded. It is in that large group of significant changes that predictability was maximal.

As a means of elucidating the background of predictability, it is relevant to define which modifying factors could be operating in these children as a group: First, for all children growth and maturation are operating, and for all of them the school experience is also a modifying factor. Teachers and other children play a part in the emotional and social growth of the child. The school group provides a satisfactory medium of expression for working out sibling rivalry conflicts. In the life of young children, especially in the case of first-born children or children from small families, this factor is far from being negligible.

While there can be no rigid rules about forecasting changes in intellectual performance by means of knowledge of the child's emotional adjustment, a number of considerations can be used as meaningful indexes. For instance, when a child upon admission at school is observed to be inhibited, fearful (often an only child who has not had contact with other children), one can expect a rise in intellectual performance and improvement in social behavior if the family background is secure. This was true with Cases (boys) 2 and 6, and (girls) 5 and 8 . If there were in the family structure elements of insecurity, progress would not be expected in that same type of child. This was true with Cases (girls) 14, 31, 17 and 19, and (boys) 16 and 18.

A child from a secure environment, but whose position is temporarily threatened by the birth of a sibling, is very likely to show a lowering in performance if tested during the period of sibling conflict. Whether the conflict would be quickly resolved or lasting would depend to a large extent on the parents' awareness of the child's needs. But there are other aspects to be considered: For example, the sibling conflict may represent in the child an expression of insecurity which is deep-seated in his own relation to his parents. As previously formulated by the senior writer (9), sibling conflict is predictable in that even before the birth of the sibling there may be in the child's personality indications of a potential rivalry which is brought to the surface at this time. In this sense the sibling rivalry does not begin with the birth of the sibling. Typical of the children likely to "recover" quickly were Cases 13 and 20 (boy and girl respectively). Typical of the children whose sibling problem was an expression of deeper conflict related to the parents, were Cases (girls) 14 and 19, and (boy) 16. The same considerations as relate to the sibling rivalry hold true of any traumatic development in the family.

As a result of gradual growth and the socializing effect of nursery school, a child from a secure environment may show a gradual but minor increase in the course of three years at school. Whether this minor increase is attributable to maturation alone or the release effected by social contacts is a moot point.

Children from consistently secure and stable environments are likely to show little or no change in their intellectual performance, as was the case with Cases (boys) 27 and 34, and (girls) 15, 33 and 35.

Children from consistently disturbed environments are probably testing at a lower level of intellectual function than would be the case if they were happy and secure. This was the case with Cases (boys) 28 and 29, and (girls) 36 and 37. If the child can have the benefit of special guidance or treatment, his intelligence quotient may rise, notwithstanding the fact that conditions at home may be changed little or none. If conditions at home are changed and the child feels more secure, similar results can be noted. This was the case with Case (boy) 9.

Major changes or gross conflicts have a repercussion on intellectual performance which can readily be anticipated. On the subject of predictability there is, however, no absolute rule, as the dynamics of the child's behavior and intellectual performance sometimes may be too complex, even when overt and latent patterns seem clearly defined through knowledge of the family constellation, daily behavior observations, and analysis of play behavior. This statement is substantiated by the fact that in six children changes were expected in another direction than that afterwards noted, or were quantitatively inaccurate though in the direction predicted. Cases (girls) 26, 36, 37 and 38, and (boys) 28 and 29 belong in this category. As pointed out above, Group II includes two types of children—some of them consistently well adjusted, and others whose home conditions were consistently frustrating. It was in this latter group that the margin of error was greatest. In contrast to an acute traumatic situation, continued frustration sets up a multiplicity of compensatory mechanisms which introduce additional elements of complexity.

There are certain factors which pertain specifically to the Payne Whitney Nursery School set-up, where individual children are carefully studied: Recognition of a problem of adjustment is the first step toward special guidance, and in a few cases even toward treatment. These are important modifying factors of behavior which cannot fail to have a repercussion on intellectual performance—as is clearly indicated in the group of children with significant changes upward. In the group with significant changes downward, it has been shown that 6 out of 10 children showed behavior changes related to the sibling, and that in all 10 children the lowering in *IQ* could be forecast on the basis of traumatic influences in the home—other than those referable to sibling rivalry. However, behavior being dependent upon complex interrelations, the recognition of a problem does not mean the solving of this problem, since it involves the insight and coöperation of parents or parent substitutes, as well as their own emotional and sexual adjustment. As can be seen from the brief accounts of the children's adjustment at school and at home, the parents are not always able to fill the emotional needs of the children, even though their coöperation on the surface and their intellectual awareness are assured.

The ideal scoring of the intellectual function would include the following data:

1. Test scoring with the usual technical differentiations regarding intellectual and motor performance, memory, digits, scatter, etc.
2. Observations on behavior in the test situation.
3. Observations on behavior in the life situation at the time of testing (with special reference to physical illness, mood, recent events, etc.).
4. Report on the total adjustment, presenting a dynamic interpretation of the individual's functioning.

As seen in the short protocols given above, there were children whose *IQ* change was not commensurate with the improvement in their overt social behavior; and in several of them, the individual play analysis revealed a latent conflict. These observations point to *the need of a projective technique, in addition to the usual methods of psychometric testing, as a means of detecting the possibility of inhibiting influences.*

The relation between severe mental illness and gross mental deterioration has been investigated by various authors. Some recent studies have also shown that children who are insecure and deprived of affection, when placed in a more satisfactory home environment very often show a rise in intellectual performance (3, 7, 8). In children brought to treatment for neurotic problems, improved intellectual performance as an outcome of improved emotional adjustment is not uncommon.

> A striking example is that of Girl E. C., 8 years 3 months at the time of writing, who was first brought to psychiatric treatment at the age of 7 years 8 months, with the following major complaints: motor

restlessness and inability to concentrate, with very poor school results; allergy (bronchial attacks of several years' duration); stealing; smearing of feces, and intra-rectal manipulation, both at home and at school. Born out of wedlock (her parents married when she was 2 years old; third marriage for father, second for mother; divorce proceedings already started at time of writing) this child was rejected by both parents, and throughout infancy and childhood had numerous and varied homes, including (sporadically) her own. At birth, she was placed by the mother, who then left the United States, in a boarding home where she experienced gross physical and emotional neglect. The mother seems to have thought of her more as a picture than as a child. For instance, she had a large series of expensive photographs made of the infant between the ages of a few months and 2 years. The actual living conditions of this baby were discovered accidentally through an unannounced visit of the photographer, who found her to be one of six infants in a small bedroom. The child was then 9 months old, and she was so cramped in her "crib" that her head alone could move. The parents were notified, and a series of examinations was made at this time. The infant was so retarded in her psychomotor development that there was a question of placement in a hospital for congenitally deficient children. At 10 months, when taken by the nurse who had delivered the mother, the child was "like dead . . . did not sit nor suck," and the nurse had to feed her with a dropper. The mothering and efficient care given by this nurse succeeded in bringing the infant closer to normal. The periods when the child was cared for by this nurse seem to have been the happiest; and at the time of admission for treatment, she had once again entered her home for an extensive stay by parental arrangement. Space does not permit of elaboration on the many aspects of this case, but the following findings pertaining to the intellectual performance are briefly recorded:

At 9 months, there was evidence of gross mental deficiency. At 5 years 5 months, when placed in the kindergarten of a private school, she was rejected after one week—her intelligence being then evaluated as that of a moron. Her IQ was 60. At 7 years 9 months (several months after entering the mother substitute's home), her *IQ* was found to be 76. At 8 years 1 month, her *IQ* was 82. At that time some improvement had already been shown in the decrease of all symptoms enumerated under complaints, and smearing and rectal manipulation had completely ceased. Her school record also indicated continuous slow progress in intellectual performance.

The 39 children included in this study, however, were not brought to observation for neurotic complaints: They are fairly representative of approximately normal behavior in a social group with high cultural drives. The variations (some of them considerable) which are reported are in keeping with the variations reported in the literature on young children. Blanchard

(5), for instance, states "Research data indicate that the *IQ* tends to be less constant if the children were first tested under the age of six years than if they were over six years old when first tested." Lack of coöperation and negativistic attitudes in that age group are interpreted by the majority of authors as responsible for these variations. Since such factors are minimal in the group studied, variations must be referred to other causes. From the presentation of individual cases given above, it seems that the variability of *IQ* is related to the emotional lability characteristic of that age group. Consistent with this statement is the observation that even in this age group a stable child from a secure environment is likely to show little or no change in his intellectual performance in the course of a three-year observation.

In the two cases reported by Blanchard (5), the children, when retested, showed a considerable rise in *IQ* coincident with the resolving of their psychiatric problem. From the report, it is also evident that the children were obviously disturbed in the test situation—a condition which did not obtain in the Payne Whitney Nursery School series. The same seems to hold true with regard to the cases of Bender and Yarnell (3); but in some reports, information about test behavior is not available, as in the writings of Dulsky (10), Chidester (7), and Chidester and Karl Menninger (8). It would be of great interest to have information about disturbed behavior, or the absence of it, in the test situation, since emotional disturbance in the total personality is not always reflected in the test behavior. This point is strikingly brought out in observations of some of the Payne Whitney Nursery School children who, while known to be emotionally disturbed, nevertheless were reported as coöperative, eager, and well adjusted to the test situation.

Scatter is given by some authors—Schafer (34), and Schafer and Rapaport (35)—as an index of disturbance in the intellectual function referable to emotional causes. In the group of children studied, scatter does not seem to have considerable value or significance. In the light of Rapaport's (32) work on memory organization and emotional influences, it is interesting to note that digit memory failures accounted for the largest percentage of failures. However, there do not seem to be specific patterns associated with failures or gains in the psychometric tests.

There can be no doubt, from the analysis of the total data as briefly summarized above, that there is a close relation between emotional adjustment and intellectual function. At the beginning of every school year, occasionally a child may give the impression of being dull, in his play behavior or even in his initial psychometric test if this is done early in the year.

Usually this child is expected to reach the level of normal or even superior, intelligence after he has become freer and has lost some of his anxieties and inhibitions. Notes to this effect are entered in the early record. Indeed, the initial differentiation between dull and inhibited behavior is one of the problems which confront the director of the school and the psychiatrist in their determination of what constitutes "normal" intelligence and behavior as a prerequisite for admission. A knowledge of the early psychomotor development of the child and observation of his behavior in the initial interview help in reaching a rough estimation of his intelligence, but it is only with a more thorough understanding of the child's whole personality that an adequate evaluation can be obtained.

In the group of 13 emotionally disturbed children tested before and after treatment by Dulsky (10), significant gains in *IQ* were found in four of the children, although the group as a whole did not show significant improvement in test scores. While Dulsky considered the group too small for conclusive evidence, he postulated "as a functional concept of intelligence that emotional adjustment is one of the variables that might influence intelligent behavior." He also indicated that "in some children intelligent behavior would be more intimately related to the emotions than in other children." Pignatelli (31), testing two large groups of problem and non-problem children of 7, 8, and 9 years of age, reached several conclusions:

> The Stanford-Binet Intelligence Test is not a suitable instrument for the qualitative differentiation of children except in so far as it is a means of measuring general intelligence. . . . That maladjustment does not appear to condition intelligence in any definite way in children of these age groups, is an important fact that has been gleaned from the present study. Though maladjustment of the problem group in this study appears to be extreme in many of the children, it is a hopeful sign that this has no deteriorating effect on the qualitative aspects of intelligence.

Pignatelli also makes the statement that "the intelligence of a child is like his physical growth. It is unsusceptible to the vicissitudes of ordinary psychological content and adjustment mechanisms." Since the children in the Pignatelli study were not retested, variability cannot be meaningful in terms of *individual* changes. Also, biographical data—at least, in the case of the non-problem group—were lacking and criteria for the control group were negative (not referred for examination because of atypical behavior; not considered a behavior problem; coming from a non-clinical, non-institutional group); so it is possible that a certain percentage of the non-problem children were inhibited children without clinical symptoms. In the absence of longitudinal studies, it is also obvious that the "deteriorating effect" of emotional disturbances cannot be evaluated. Nevertheless, such investigations reveal an awareness of the dynamic quality of intellectual function which was absent from earlier psychological studies.

In presenting the 39 Payne Whitney Nursery School children, the condensed protocol form was selected, since this made it possible to bring out pertinent facts of the psychometric test results and social behavior in all cases. The analysis of test items does not reveal significant patterns nor reliable criteria for emotional maladjustment, although scatter is relatively meaningful. The analysis of the total records (psychometric tests, physical examination reports, anamnestic data and observations on group and individual behavior, play analysis records) indicates that *intellectual function, as measured through psychometric tests, shows fluctuations, and that the child's total emotional adjustment influences his test score.* Total emotional adjustment, on the other hand, cannot be adequately evaluated through observations on behavior, and affective rapport to the examiner in the test situation alone. Nor is it sufficient to be acquainted with the child's overt social behavior outside of the test situation. *This study emphasizes the need to evaluate the potentialities of intellectual function by means of special techniques.* For the sake of brevity, and in the absence of dynamic studies, projective techniques would be a good adjunct to the usual psychometric tests.

VIII. SUMMARY

Since 1937 personality studies of normal children have been in progress at the Payne Whitney Nursery School. The records include anamnestic data, physical examination reports, psychometric test findings, daily behavior records, and individual play sessions. This method of investigation permits the analysis of any one phase of behavior in relation to any other phase. In the present study, an attempt has been made to establish whether any relation could be found between intellectual function, as measured by means of psychometric tests, and emotional adjustment, as evaluated through the total data. The trends of emotional adjustment were formulated independently of the findings of the psychometric tests.

Of the children admitted during the period from 1937 to 1942, 39 children had at least two psychometric tests in the course of two or three years' attendance at the school. On retest, 22 showed changes in *IQ* which were considered significant (10 points or more in either direction), and 17 showed no significant changes (less than 10 *IQ* points, or no change in either direction).

Of the 22 children with significant changes, 12 showed an increase in *IQ* rating of from 10 to 31 points, and 10 a significant decrease of from 10 to 19 points. In all of the 22 children which made up the two subgroups, there was a close parallel between emotional adjustment and psychometric test findings.

The 17 children without significant changes in *IQ* presented a more complex problem of analysis. They included two categories of children: stable, well adjusted children whose home life seemed to present no cause for emotional disturbances; and children whose home conditions, while unsatisfactory, did not show variations or tendency toward marked improvement or further dislocation. The margin of error for predictability of *IQ* changes on the basis of biogaphical data was higher in this group than in the group with significant changes. In six children, variations in *IQ* were predicted in another direction than that afterwards noted, or were quantitatively inaccurate though in the direction predicted.

The present study emphasizes that intellectual function, as measured through psychometric tests, shows fluctuations, and that the child's total emotional adjustment influences his test score. It also points to the need of a projective technique, in addition to the usual methods of psychometric testing, as a means of detecting factors inhibiting the intellectual function.

The clinical data have been presented and analyzed, but no hypothesis has been formulated regarding the inhibition of the intellectual function through emotional causes.

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THE SMILING RESPONSE: A CONTRIBUTION TO THE ONTOGENESIS OF SOCIAL RELATIONS*

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I. THE PROBLEM

A. INTRODUCTION AND SURVEY OF LITERATURE

In its beginnings as an autonomous science academic psychology investigated the manifestations of the human psyche (Appendix A) in *vacuo*, as it were, as if there existed such a thing as a human being without constant relationship with other human beings. Today psychology has developed into the science of human relations. Toward the end of the last century it became clear that psychological statements based on observations and speculations about an isolated individual result in answers which are at best useful in physiology, certainly not in psychology. It was discovered that the object of psychology could only be observed and studied in terms of function, in terms of relationships; and that it made as little sense to speak of an isolated human psyche as it does to speak of a law of gravitation in a universe comprised of one body. Just as the law of gravitation is a statement about interactions taking place between several physical bodies, so psychology is a science making statements about phenomena taking place in the presence, whether actual or imaginary, past or potential, of several individuals (Appendix B).

When psychology became the science of interactions between the individual and the totality of his environment, with particular stress on interpersonal relations, it had of necessity to describe these relations not in static terms, but in terms of dynamics and in terms of forces. The most evident manifestation of these forces are the emotions, and ever since Freud introduced his epoch-making genetic and dynamic concept of psychic processes and structure the focus of psychological research has been increasingly on these phenomena. We have, as a result, come to realize the significance of the emotions and of emotional interplay for the vital equilibrium of the human being.

In a study (61) on infants in their first year I have been able to demonstrate that emotional starvation (due to lack of social relationships) in its extreme form is as destructive for children in their first year as physical starvation, and that it results in death or irreparable psychiatric damage. These findings were made and expressed in statistical terms with the help of Developmental Quotients (Appendix C) bearing in mind the divergencies in the affective factors in the children's surroundings.

This was a very generalized approach which provided the basis for our further investigations. We collected an extensive body of observations on this subject, but only the findings of striking developmental differences in four divergent environments were correlated with the circumstances operative in each given environment. The problem of the infants' emotions as such was not touched upon. An investigation of the emotions and their manifestations during infancy, that sector of infant psychology in which pioneer investigations were carried out by the two Shermans (57), Watson (65), and Goodenough (38, 39), then constitutes the next step in our research. The experimental findings and theories of these authors are ably and extensively summarized by Mary Cover Jones (45).

If we are to understand more about the rôle of emotion in the life of the infant, however, we must carry our investigation beyond the mere comparison of developmental differences. We must investigate the infant's emotions themselves, their manifestations, and their nature.

But this is not a simple undertaking. All the manifestations observable in the newborn, be they somatic or psychic, are diffuse, undifferentiated, rudimentary, and inconsistent. Reaction to stimuli is usually non-specific, and presents for the most part a picture of generalized overflow reaction. Stimulation in one part of the body (e.g., eliciting the grasping reflex) results frequently in the response of a totally different, unconnected part of the body (e.g., sucking response) (43).

Emotional stimulation may provoke a body response, and conversely somatic stimulation may bring forth an emotional response. Systems, which are usually considered well isolated from each other in the adult, show unlimited permeability in the newborn. In the first hours of life any system seems to be interchangeable with any other one and able to perform vicarious functions.

We are in a particularly precarious position when we attempt to investigate the infant's emotions, for it is extremely difficult to differentiate emotions in the infant in the same manner as we differentiate them in grown-ups. Even if we limit ourselves to the most elementary terms and speak of only two forms of emotional feeling, negative and positive, we find that this is still too ambitious a program, for in the case of the neonate we witness behavior which seems to be limited to the manifestation of negative emotions only (7, 13). We know of no behavior in the new-born which could justifiably be called the manifestation of a positive emotion. Its counterpart, in the neonate, is quiescence.

The earliest manifestation of emotion in the human being probably consists in the screaming and crying of the infant. We are probably justified in describing the circumstances which produce this behavior in the baby as painful. One can reason physiologically and say that physical factors such as hunger, thirst, painful disease, injuries, lack of air, and extreme thermal stimulations inflict suffering. Or one can reason by analogy from adult experience and say that such interference as abrupt interruption of perceptual stimulation, restraint or interruption of motor activity, and interruptions of quiescent states by strong though not necessarily painful stimuli inflict suffering. We need to reason by analogy only in a minority of cases, however, for most of the situations where a neonate screams would not only cause suffering in an adult—they are for the most part accompanied by physiological processes which are demonstrably painful as well. For this reason we believe we are justified in stating that crying and screaming in the new-born expresses negative emotions. The details of the nature of these emotions are unknown to us. No differentiation has been attempted in regard to their quality, nor are we likely in the near future to be able to distinguish differences in the new-born's negative emotions which would give us a clearer insight into their significance.

On the other hand the new-born does not possess any means of expressing positive emotions beyond that of an attitude of quiescence or acceptance of the stimulus offered (such as when he swallows food introduced into his mouth). We therefore feel justified in assuming, provisionally, that in the new-born there exist only two primal undifferentiated emotional attitudes: that of accepting and that of rejecting a stimulus. Even this statement should probably be qualified, since there is some doubt whether acceptance of a stimulus is really a positive attitude. It might be also assumed that when a stimulus like food or warmth is accepted it does not create emotional reaction, but is rather incorporated into the child's system of psychic equilibrium without disturbing his state of quiescence. Conversely, when a negative emotional manifestation is stopped by "positive" stimulation (such as food, warmth, etc.), then it might be that the removal of the negative stimulus merely re-instates the previous situation of quiescence, without creating a positive emotion at all.

Whether we assume one primal emotion, the negative one, or two primal emotions, a negative and a positive one, it is from these that the whole gamut of later emotional experience and emotional reaction will be developed. But while emotion in the grown-up may be expressed by mental, ideational, verbal manifestation, or by facial expression, the modes of manifestation at the disposal of the new-born appear to be restricted to the phenomena of discharge in the province of the autonomic nervous system, or to the phenomena of overflow in the system of voluntary innervations. The greater specificity of emotional manifestations in the new-born is found in the autonomic sector of the nervous system and it is noteworthy that during later life, too, the linkage between emotions and the autonomic nervous system remains a close one.

The developmental differentiation of emotional manifestations closely parallels the diacritic (Appendix D) perceptive development and the development of voluntary body mastery. One of the first manifestations of positive emotional experience in the infant is the smile. We realize that we lay ourselves open to criticism when we speak of the baby's smile as a manifestation of positive emotion, or as we will call it from now on, of pleasure. We have no way of knowing whether the infant really experiences pleasure when it smiles. An old wife's adage states that, on the contrary, when the baby smiles it has a belly-ache. As a general statement the adage is certainly false, but the slight amount of truth it contains makes it necessary to discuss it and to elucidate the question as to what the smile of the baby really is.

Whenever we speak here and in the following of "smiling" we will refer to the facial configuration of lips and face known as "smile" in grown-ups. We shall also include those pathognomic[1] activities such as grinning and laughing which in grown-ups, or in the older child, are considered as even more pronounced manifestations of the emotions which evoke a smile.

Smiling in the form of the pathognomic activity of widening and curling of lips appears quite early in the baby—according to Ch. Bühler as soon as the tenth day of life (11). We have observed and filmed an infant smiling on the 8th day of life. A few earlier observations (Blanton, Watson, Ament, Dearborn, Moore) are reported in the literature. There seems no reason to question the possibility of smiling immediately after birth, since at this early age smiling does not appear to be correlated with any specific stimulus or situation. It is one of the numerous expressive movements of the face observed in the baby, such as frowning, opening and closing of the mouth, protruding of the tongue, and facial distortion which we consider to be in the nature of the overflow phenomena. It does not differ in this from the squirming, writhing movements of arms, legs, and trunk, which appear indiscriminately at this age whenever a stimulus strong enough to overcome the very high perceptive threshold of the first week of life is offered. Under these circumstances it is obvious that any of these manifestations, including smiling, can occur in response to any stimulus; thus the old wife's adage, according to which the baby smiles when it has a belly-ache, is justified in a way. The baby may smile when it has abdominal pain, to be sure. But it may also squirm or frown or do any number of other things for the same reason. This period of indiscriminate manifestation of pathognomic activity, however, is outgrown very soon in the course of the baby's development. By the third month his smile has become a reaction distinctly linked to certain stimuli. The nature of these stimuli differentiates them definitely from any experience which could be called painful or diasagreeable in the grown-up. From this point on it will not be possible to say that when the baby has a belly-ache it smiles (Appendix E). From this age level on (more accurately from this developmental level on, since the chronological age varies) smiling will not be manifested in any psychological situation in which pain, rage, anger, boredom, or neglect is experienced. These are the situational configurations in which neither the infant, the toddler, the school child, the adolescent, nor the grown-up will smile except in one of those conventional elaborations of the smiling gesture which are developed into a semantic system of facial expression in the process of growing up. It appears therefore that there is an unbroken genetic line for a large number of situational configurations which do *not* act as a stimulus for smiling.

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[1] Pathognomic (from the Greek Pathos—suffering, passion, and gnome—judgment). The recognition of emotions and passions through their outward signs and expression. (*Webster's International Dictionary*, 1943.) Modern scientific tradition has limited the usage of this term more or less to facial expression.

On the other hand, from this developmental level on the infant does produce the smiling response in a certain well defined situational configuration. As Gesell and various other authors have stated, this situational configuration can be described in psychological terms as the anticipation of the gratification of a specific need. We will discuss in the last part of this paper the characteristics and factors involved in this "need gratification." Suffice it to say here that it takes place on the social level and that the infant's behavior in response to it manifests physiognomic characteristics of *striving toward* the stimulus configuration; two months later it gives the impression of striving for, and of pleasure in, reciprocity. Since pleasure is an emotional shading which can only be ascertained with the help of introspection, the physiognomic characteristics of the infant's behavior alone would be insufficient to justify our assertion that the infant smiles because it experiences pleasure.

We find, however, that the specific situations of need gratification in which the infant smiles are the same as those in which the toddler, the school child, the adolescent, and the grown-up smile. Furthermore, introspection among older children and adults reveals that the emotion they experience in these situations is pleasure. Inasmuch as the older child and adult introspectively reveal as pleasurable those situations which bring forth a smile, and inasmuch as the infant's smile is evoked in the same kind of situations, it is clear that there is an unbroken genetic line connecting the pleasurable experiences of the infant and the adult.

Three statements can be made about the infant:

1. A wide range of emotions exists in which the smile never occurs from the third month on.

2. The situation in which smiling is produced from the third month on is always *one of a specific need gratification.*

3. The physiognomic characteristics of the infant's behavior in the smiling response remains the same from the third month on, and can be defined by the behavioristic term of "*Zuwendung*," turning towards.

As soon as verbal communication becomes possible these three elements as well as smiling are connected with the introspectively recognized emotional shading of pleasure. We feel therefore that the evidence is overwhelmingly in favor of assuming that the infant also experiences the emotion of pleasure when it smiles.

In the baby, however, at least during the second quarter of the first year, it is not *every* satisfactory or pleasurable experience which evokes the smile. Thus the infant does not smile consistently at its food or at its toys. The stimulus by which its smiling can be consistently evoked must be a stimulus coming from a human partner (12, 53). Various manifestations of the *human partner can evoke the baby's smile. Referring to what we have said* above about psychology being the science of human interrelations, it is of interest that smiling develops at a very early age into an essentially social manifestation, the manifestation of pleasure experienced when beholding the presence of a human partner.[2]

This in itself is quite unexpected. However, it is put into still more striking relief by the fact that it stands out as by far the most advanced among the child's reactions at this period. For if we study closely the behavior inventory of the third month of life—or even that of the fourth—we find that no other behavior pattern shows as much perceptive discrimination or of specificity as does the smiling response on beholding a human being. It is as if the infant had suddenly developed a behavior pattern far in advance of the rest of its behavior. This phenomenon of the early appearance of the smile as a fully differentiated diacritic manifestation, at a period when no such manifestations exist in any other sector of development is a further support of our assumptions on affects. We assume affects to be the prerequisite for perception as well as for all other mental activity. We find in studying the behavior of the child that affective discrimination is the earliest of all and breaks the trail for all the rest of the development.

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[2] That the human face is the most potent visual stimulus during early infancy has attracted the attention of investigators in fields so far removed from our present study as that of ophthalmology. It has been put to use there in studying eye movements (47).

I do not believe that most psychologists have visualized the phenomenon in these terms and it is tempting to speculate why they have overlooked this fact. Probably since the new-born is unconsciously considered a human being right from the beginning, the fact that at times its social behavior resembles that of a human being, does not surprise them. We are all inclined to overrate the intellectual performances of the infant, we are prone to what I call an "adultomorph" approach. In its earlier stages the whole theory of the infant's mental life was impregnated with this error. Later workers in the field of infant psychology on the other hand became conscious of this source of error and sought to compensate for it. They did so by treating the infant as a machine to be observed only in stimulus-response terms. This resulted in an atomization of the infant's whole personality into a multitude of small sectors. It is hardly surprising that in this process *total* personality reactions and emotions were lost and that this procedure erred as much in its way as the "adultomorph" method.

Nevertheless, there are some indications in the writings of these psychologists that they do have an inkling of the momentousness of this period. For instance it is hinted at, though by indirection, when Sigismund (59) calls the first three months of life *"Das dumme Vierteljahr,"* (The dumb Trimester). But it is only in the last 20 years that the attention of even a few psychologists has been directed toward the smile of the baby as a psychological phenomenon which might perhaps warrant at least as much consideration, say, as whether the infant is able to support its own weight by its hands. But even their writings are meager on the subject. In Murchison's (52) *Handbook of Child Psychology,* 2nd edition, 1933, for instance, there are only two references to smiling as a form of infant behavior, and two to smiling as a social behavior. The three first references are in the article of Ch. Bühler, the last one in the article by Mary Cover Jones. Truly an impressive poverty in a collection of articles on child psychology by the best known authors in the field, allegedly covering every phase of the subject in a volume of 956 pages! In Gesell and Thompson's book (37) *Infant Behavior,* 1934, the index contains no reference to smiling, while laughing is only cursorily touched upon in the frame of reference of language behavior.

Nevertheless even at that time there existed a detailed study of smiling in infants by R. W. Washburn (64). The phenomenology of the infant's smiling behavior is described in Chapter I of this monograph in utmost detail. In another chapter methods of stimulating smiling and laughing in infants are investigated in similarly great detail. This analysis shows that social stimulation is far and away the most effective method for provoking smiling. The results are then correlated with age, frequency of smiling or laughing responses, developmental level, developmental quotient, age level, weight-height indices, and age of mother. The detail and exactitude with which measurements seem to have been conducted would make this monograph appear a very valuable one.

There are, however, two major objections to this study: (1) Exiguity of the material. The study has been conducted on a total of only 15 subjects, of which four were observed eight times. Half of the subjects were observed five times or less. This is the material on which the author bases all her conclusions, including a typology which comprises four groups: the serene, the emotionally labile, the cheerful and the sober. (2) Neglect of certain indispensable methodological safeguards, to wit: (*a*) The subjects are removed from their habitual environment to a special examining room in another part of the city, an interference which is disturbing to any small child. The intensity of this disturbance, what is more, varies not only with the child's personality and background, but also with the child's age. Thus a new variable is introduced into the experiments which cannot be expressed in terms of the variables investigated by the author. (*b*) The author does not take into account that making these experiments in the mother's presence, in many cases with the child sitting on the mother's lap, in many others provoking the child's laughing response through the mother's intervention, falsifies her results.

Nonetheless the author has revealed a number of facts which are of value for the understanding of the smiling response. One of these is that inanimate objects alone do not elicit smiling or laughing. Another is that the constantly smiling face of the observer was the most effective stimulus for eliciting the child's response. A third is that the period in which the smiling response can be provoked extends from 12 to 40 weeks and that after that time it becomes difficult to elicit it. These are statements which conform with the observations of later investigators (12, 46, 53, 64) who observed and were interested in the phenomenon in various ways. The interpretations range from the assumption that the child is imitating (here again the problem arises as to what imitation is, why it occurs and how it is provoked), to the assumption that he is behaving spontaneously.

Other investigators have discovered that the infant reacts by smiling to three classes of sensory perceptions of the human being, namely the visual, the auditory, and the tactile. Of the three, visual perception elicits the infant's smile by far the most frequently and regularly, which explains why the current interpretations of smiling behavior refer quite exclusively to its appearance in response to the visual stimulus offered by the human face.

Arnold Gesell (36) believes that in the course of development the human face is connected with a large number of "expectancies" associated with satisfactions and that the infant finally reacts by smiling to the element most frequently seen in connection with these expectancies,—a sort of conditioned reflex, as it were. Charlotte Bühler (14) believes that the smile of the baby is a social phenomenon from the outset, that the smile is *the* specific reaction to social contact, to the voice and the glance of the human being. She states explicitly that of all visual stimuli which can be expected to elicit the new-born's interest, the human face is the only one which provokes a smile by the end of the second month (15).

Hetzer (41) states that even in the fourth month the presentation of the bottle does not elicit a smile.

The finding that children between the age of two and six months reciprocate the smile of grown-ups who approach them, was interpreted by Charlotte Bühler (14) to mean that the child reflects the expression, smiling or serious, of the grown-up. She obviously chose the term "reflects" to avoid an interpretation of the reasons underlying this behavior of the child. It is, however, hardly possible to avoid the assumption that this imitative behavior must take place by means of some sort of rudimentary identification.

On the strength of a series of cleverly devised experiments Eino Kaila has stated that between the child's third and fifth month the smiling reaction occurs in response to certain Gestalt-configurations in the human face (46).

Kaila's experiments were made to determine whether the infant imitates the adult's smile and whether this imitation is indicative of a process of identification with the adult's attitude. His experiments showed that the smile between the third and the fifth month has nothing of the nature of imitation in it, but is a reaction to a stimulus configuration. The configuration fulfills certain, though not all, of the conditions of a visual Gestalt. He continued his experiments beyond the fifth month and could show that imitation starts much later than the smile and that it starts with much more elementary movements of the facial muscles than the complicated action of smiling. He assumed that the imitative activity is, at its beginning at least, not directed toward pathognomic expression of emotions, but toward the reproduction of perceptions which have the qualities of a visual Gestalt.

Kaila showed experimentally that it is not a specific person (the mother, as it was generally believed) whom the infant recognizes and greets with a smile between its third and sixth month. Having shown this, his problem was then to isolate those factors in the human face in general which become effective as a stimulus for the child's smiling response (Appendix F).

Kaila further found that the child stops smiling if the experimenter turns sideways (in profile) or if he covers his eyes. He also found that it is not necessary for the experimenter to smile to induce the child's smiling response; it is sufficient if he shows his head *en face,* making any kind of movements, nodding, for example. Not only is it unnecessary for the experimenter to smile under these circumstances, but he can even cover his mouth and the child will continue smiling.

To summarize Kaila's experiments and conclusions, he found that from the third to the sixth month babies respond with a smile to the stimulus of the adult's face under specific, well defined conditions. These conditions consist of a stimulus configuration composed of two factors:

1. The stimulus offered has to consist of two eyes plus nose and forehead (the forehead must be smooth, not frowning). If this stimulus configuration is modified, if for instance the experimenter turns his head in profile or frowns, the child stops smiling and loses contact with the experimenter.

2. The stimulus must be accompanied by motion in the rest of the face. If the smiling infant is confronted with an unsmiling, motionless face, it stops smiling, loses contact and often appears upset. The nature of the motion of the experimenter's face may be smiling, or talking, or head-nodding, etc.

Our summary of Kaila's findings and of the way he formulated them makes it evident that he eliminated the problem of emotion from his approach. Charlotte Bühler, on the other hand, emphasized the factor of emotion by formulating the hypothesis that the child "reflects" the grown-up's friendly or serious expression. Kaila succeeded in disproving the assumption of the child "reflecting" anything at this early age (simultaneously he disproved the assumption of Guernsey (40) who assumes that infants imitate the facial gestures of adults from the second month on). Having disproved imitation, he had to use another explanatory framework, and for this purpose he employed Gestalt concepts. The question as to the rôle played by emotion thus vanished as by an act of sleight of hand and the problem was returned again to the old mechanistic terms of the 19th century. To disprove that the child imitates the emotional expression of the grown-up, however, does not at the same time disprove the emotional nature of the child's manifestation, nor does it disprove its social character.

Kaila's experiments are both brilliant in their originality and precise in their method. We are indebted to him for some of the most stimulating findings on early infancy. It is with this debt in mind that we shall examine those points in which his findings fall short of our own aims.

For the purpose of a first orientation to the problem of the smiling response his material was adequate. But if we wish to understand and evaluate the phenomenon, we must admit that this material is insufficient, for it comprises a total of 71 infants from one single institution, all of the same racial, national, and cultural background. This is a very one-sided sample, further restricted by the fact that he selected only those infants who smiled readily.

Of these infants, 37 were observed only for one week and the rest for longer periods, the maximum being a group of six infants, for nearly two months.

The briefness of the observation period may be attributed to circumstances beyond the investigator's control. Nevertheless, it also fits into Kaila's scientific bias as Gestaltpsychologist for whom the structure of a psychic phenomenon at a given moment is important but who is not concerned with the genetic viewpoint. Accordingly, the development of the phenomenon is hardly touched upon and the fact that modifications of developmental factors may lead to completely different manifestations is overlooked.

This brief survey of the literature suffices to show that the greatest part of the significance of the infant's smile is still unexplored and unexplained. But the fact remains that the smile is, after all, one of the two possible pathways[9] for the understanding of emotions during the early stages of preverbal development. It was this insight which started us on our present investigation, the objectives of which may be enumerated as follows.

B. General Purpose of Present Study

1. To revise the findings of Kaila's study of the smiling response on the basis of an extensive sample diversified according to race, cultural background, and environment.

2. To establish the developmental pattern of the smiling reaction and the age-range within which it is manifested, by investigating it on com-

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[9] The second, as we have already pointed out, is the negative manifestation of emotion, as in crying. This will be explored in a subsequent publication.

parable numbers of infants at several age levels within the first year of life.

3. To investigate the necessary and sufficient conditions for provoking the infant's smiling response.

4. To establish whether the smiling response is an individual peculiarity, a cultural acquisition, a racial trait, or a universal pattern.

5. If the latter is the case, to investigate the exceptions in the smiling pattern and to attempt to find the conditions under which such exceptions occur.

6. To investigate the significance of the smiling response as an emotional manifestation as well as its significance from the point of view of the child's emotional development.

II. IS THE SMILING RESPONSE UNIVERSAL?

With these points in mind, I devised a new series of experiments with the aim of clarifying the issue and following it up to its logical conclusion. We shall now describe our experimental sample and methods.

A. The Sample

A total of 251 children, 139 males and 112 females, was investigated. In any such experiment the problem of nature versus nurture arises, i.e., the question of congenital and that of environmental influences on individual response. With the intention of throwing some light on this question in regard to our problem we diversified our material according to two leading principles. (*a*) *According to heredity*. For this purpose we investigated children belonging to three races, distributed as follows: 105 white, 39 colored, 107 Indian. (*b*) *According to environment*. For the purpose of elucidating the possible effectiveness of environmental influence we investigated five different environments: private homes (upper class professionals), a baby nursery, a foundlings' home, a delivery clinic, and an Indian village.

Table 1 shows the total distribution of the children according to environment and race.

TABLE 1
Environment

Race	Nursery	Private home	Foundlings home	Delivery clinic	Village	Total
White	57	15	21	12	—	105
Colored	39	—	—	—	—	39
Indian	—	—	48	33	26	107
Total	96	15	69	45	26	251

Other than diversification as to race and environment no further selection was attempted. In each environment the *unselected total* of the available infants was examined. Within this unselected total four age groups were distinguished as the result of the average appearance and disappearance of the smiling reaction. They are:

1. A group of 54 children observed from birth to their 20th day.

2. One hundred and forty-four children observed from the age of 20 days to 60 days.

3. A group of 132 children (this group covers the previously mentioned 144, less 12 who for varying reasons could not be followed) tested during their third, fourth, fifth, and sixth month. To this has to be added a group of 13

children who came under observation only after their third month, bringing the total of this group to 145.

4. A total of 147 children were followed from their sixth month to the completion of their first year. Of these 108 had already been followed from their third to their sixth month.

An additional group of 39 children came under observation for the first time only after their sixth month.

In all our experiments (both those mentioned up to now and those to be discussed subsequently) we introduced certain basic safeguards. As far as possible each experiment was performed on each child by a male experimenter and by a female experimenter separately, at different times to determine whether there were differences in reaction to one or the other sex. Talking to the child (or in its presence) or touching it either before or during the experiment was avoided. Where it was necessary to move the arm of the child for photographic purposes we were careful to take hold of the clothing only. Thus the exclusively visual quality of the stimulus offered to the children was preserved.

Finally we narrowed down the visual stimulus to that offered by the experimenter's face. To avoid falling into the error committed by Washburn (64) we were careful to perform our experiments in the absence of the mother or at least to exclude her from the visual field of the child during the experiment. We were investigating the nature of the stimulus of the child's smiling response and the presence of the mother would have introduced an unpredictable variable into the test situation, because the emotional relations of infants with their mothers vary from one emotional extreme to the other. Furthermore, a smile of the child in the presence of the mother would have to be interpreted in the light of the fact that a pre-existing emotional relation was coloring the child's attitude, whereas a smiling response to the experimenter is a response to a stimulus seen for the first time. Finally the difference between the mother as instigator (26) and the experimenter as stimulus of the baby's response varies greatly at different developmental levels of the infant, as we hope to show in subsequent publications.

With the exception of the 26 children in the Indian village, each child was submitted to the smiling stimulus from 5 to 30 times during the critical period of the third, fourth, fifth, and sixth months. Since each experiment was performed both by the male and the female experimenter, whenever both were available, the number of reactions is nearly double the above figures. Furthermore, as will be explained in the experiments described below, the smiling reaction of the babies was provoked 8 to 10 times in each experiment, as a consequence of the modifications which were added to the experiment. The very large number of experiments thus performed on each child excludes the possibility of accidental results. These repetitions bore valuable fruit in other directions too. They provided us, for example, with data which contribute to an understanding of the deviations in the usual pattern. Of these deviations, more later.

B. METHOD

In our first set of experiments we presented a smiling or nodding face as a stimulus fully "en face" so that the children could see both eyes simultaneously. When the child responded with a smile we slowly turned our face into profile, continuing either to smile or to nod. If the child now stopped smiling, we turned the face back "en face" and tried to provoke the smile again.

C. RESULTS AND DISCUSSION

The first important result to emerge from our investigation is the age distribution of the smiling response, the rise and fall of which is vividly illustrated in Table 2.[4]

TABLE 2

Response	Age Birth to 0;0+20	 0;0+21 to 0;2+0	 0;2+1 to 0;6+0	 0;6+1 to 1;0+0
Smile	—	3	142	5
No smile	54	141	3	142
Total	54	144	145	147

The age limits indicated in this table should be considered as zones merging imperceptibly into each other. For instance, the smiling response does not disappear suddenly after the sixth month. This disappearance is a gradual one and becomes complete by the end of the 8th month. It should also be stressed that the significant contrast between the first and the second half year of life lies in the fact that in the first six months the infant smiles *indiscriminately* at *every* adult offering the appropriate stimulation, whereas in the second half it *may* smile at one person or another, if so inclined, but will not smile indiscriminately at everybody.

Perhaps it should also be mentioned that even during the peak of the smiling response infants will only respond if the experimenter has the ability to focus their attention, and if there are no gross interfering circumstances such as sickness, sleepiness, disturbances with screaming and crying, to inhibit the reaction of the child.

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[4] Age is designated in years, months and days. Thus 1;3+16 means one year, three months and sixteen days.

As expected, children of less than 20 days do not respond to the smiling stimulation. After all, it is generally conceded that during the first few weeks the infant's reactions are diffuse and uncoördinated, their perception inadequate, their attention unfocussed. The minimal necessary conditions for a stimulus to evoke a reaction are: (*a*) that the stimulus be perceived; (*b*) that the attention be focussed on it sufficiently to permit a reaction to take place; (*c*) that the neuromuscular reaction patterns be sufficiently coordinated to make reaction possible.

None of these conditions is fulfilled at this age and accordingly none of the infants examined by us showed any of these reactions. Of course, smiling as a spontaneous movement could sometimes be observed just as any other facial contortion.

We also expected to find the largest number of reactions in the group covered by the 3rd, 4th, 5th, and 6th months. All previous investigators spoke of these age levels as being the ones characterized by smiling; smiling has, therefore, been incorporated as a test for infant development in the testing procedures of Hetzer & Wolf (42), Gesell (35), and others. Again our expectation was fulfilled, though in a measure far surpassing anything we had imagined. The unfailing presence of the smiling reaction at these age levels makes the few exceptions, which comprise only 2.07 per cent, all the more significant and worthy of investigation.

The concentration of the smiling response on the age group between the third and sixth month induced us to limit the main body of our investigation to this period. The distribution of this age group according to environment, race, and presence of smiling response is shown in Table 3.

Table 3 shows that neither in regard to race nor in regard to the sociological structure of the environment was any gross difference in the reaction to the smiling stimulus discernible. We can, therefore, conclude that the smiling response is a universal human pattern, which is not influenced either by race or by environment.

As we shall see, there is good reason to believe that certain environmental factors can have a very marked effect indeed on the development of the smiling response. These particular environmental factors, however, were not operative in the environments which we studied, for age groups up to the point where the smiling response is at its peak.

TABLE 3

ENVIRONMENT AND RACE

	Institution			Private home		
Response	White	Colored	Indian	White	Indian	Total
Smile	53	26	23	14	26	142
No smile	1	1	—	1	—	3
Total	54	27	23	15	26	145

These uniform results over a widely diversified range of subjects are strikingly consistent and contribute to our conviction of the universality of the smiling pattern; we are also impressed by the hardiness of this pattern, a finding which makes deviations all the more interesting for us.

As we have stressed above, these results were more or less to be expected, except for the extraordinary reliability of the presence of the smiling response during the second trimester of life.

We have, on the other hand, found some rather unexpected phenomena. One is the appearance of the smiling response in a few rare cases as early as the twenty-fifth day of life. In our material the cases in which the smiling response occurs before the end of the second month total 2 per cent. (The rarity of the phenomenon no doubt explains why it was not noticed by previous observers.) The scattered nature of its inception during this period places it into marked contrast with the uniformity of the reaction in the second trimester of life. We shall attempt to find an explanation for these exceptions later on.

Another unexpected result is the extinction of the smiling pattern after the sixth month. The proportion of children in the last third of the first year who smile indiscriminately at the approach of a smiling stranger is less than 5 per cent. In our later discussion we shall analyze these exceptions and try to find out whether factors within the individual history of these children offer any explanation of their divergent behavior.

All in all, we can say that this part of our investigation has shown us a phenomenon in infant behavior which is narrowly circumscribed as to the age levels at which it appears, but which within these age levels seems to be as unshakeably consistent as the patellar reflex. For this reason we shall be able to make use of it in the same manner as we make use of a tendon reflex: its absence, or its atypical manifestation, will call our attention to a dysfunction within a certain area of the personality. We have said in the introduction to our problem that the psychological area to which we are referring is that of the infant's emotions. If, after the manner of physiological concepts, we can speak of a homeostasis (Appendix G) of individual emotional life, disturbances in the infant's smiling reaction in the period covering the 3rd to 6th month will indicate an imbalance of emotional homeostasis. On the other hand the presence of the smile during the second trimester is *not* a sufficient indicator of emotional homeostasis. Like any tendon reaction, when positive, the smile is *one* of the signs of normal functioning, a necessary, but not a sufficient index. The same holds true of the patellar reaction: when absent it shows a disturbance in some part of the reflex arc, including the posterior spinal tract. But this statement cannot be reversed: even if the patellar reflex is present there may be a disturbance in the lower part of the posterior spinal tract.

By claiming that the presence of the smile in the second trimester of life is a necessary (though not sufficient) indicator of emotional homeostasis we have implicitly voiced our skepticism in regard to the explanations offered by previous investigators, be they introspective ones (like that of the child "reflecting" the grown-up's expression) or stimulus-response explanations (like that of the child reacting to the stimulus of a Gestalt configuration). It now becomes incumbent upon us to investigate two sets of problems. The first is that of what are the conditions, physical and otherwise, which provoke the child's smiling response; in other words, we will have to undertake a detailed analysis of the stimulus which becomes operative in provoking the infant to smile, and this analysis must proceed both from the point of view of the stimulus-phenomenon's physical appearance and from the point of view of its possible psychological significance. Our second problem will be to investigate the emotions expressed by the infant when it responds to the smile. We shall deal with these two sets of problems separately and shall now proceed to investigate the first, the conditions which provoke the smiling response. In order to do so, we have applied to the relevant sectors of our sample, the 145 children between the age of two months and six months, a new series of experiments which will be described below. These experiments were also conducted with the 144 children between the ages of 20 days and two months and with the 147 children between the ages of six months and one year. These two last groups, however, were investigated only for purposes of completeness as well as to find out whether they showed any striking response. The main body of data for the discussion of this problem is based on the two- to six-month age group.

III. WHAT ARE THE NECESSARY AND SUFFICIENT ATTRIBUTES OF A SMILE-PROVOKING STIMULUS?

A. Purpose of Investigation

Our aim in these experiments was a twofold one. In the first place, we wished to ascertain whether at this early age the child is capable of perceiving, understanding, and evaluating the emotional expression of the human face. The second problem which I tried to elucidate was whether the human face in its human quality is the stimulus for the child's reaction, or whether the stimulus is a configuration *within* the human face.

B. Method

With these problems in mind three series of experiments were developed. In the first series the emotional quality of the stimulus was removed while conserving the configurational elements. In the second series of experiments the human attributes of the stimulus were removed, again retaining its configurational factors. The third series of experiments is merely an elaboration of the second under more stringent conditions.

1. *Experiment I*

The emotional quality characterizing a smiling, nodding grown-up's face is that of friendliness, at least for other grown-ups. The configurational factors of a smiling face, on the other hand, are the forehead, the two eyes, the nose and the mouth, with a widening movement of the mouth-lips-cheeks region. In this experiment we exaggerated this movement in the extreme and achieved an effect similar to that of certain Japanese theatrical masks used in the No-plays, a species of *rictus* or *risus sardonicus*. A similar mimic expression is to be found in the headpieces of Japanese armor and also in certain ancient Greco-Roman theatrical masks. The purpose of all these masks was to inspire terror; the expression is perhaps best described as that of a savage animal baring its fangs (Figure 1).

No grown-up would be inclined, even for a moment, to mistake this expression for one of friendliness, or of pleasure. Its savagery is unmistakable.

a. Results. This stimulus was offered to 142 children between the third and sixth month. Films were made in 33 cases, on 16 mm. film, with 24 exposures per second. In 141 of the cases in which the smiling reaction was positive the rictus experiment was equally positive. In one case where the smiling experiment was positive, the rictus experiment was negative.

This child was approaching the upper age limit of six months (0;5+10).

Between the third and fifth month of life it was never negative when the smile was positive. It was, however, positive in one case before the second month in which the smile was negative.

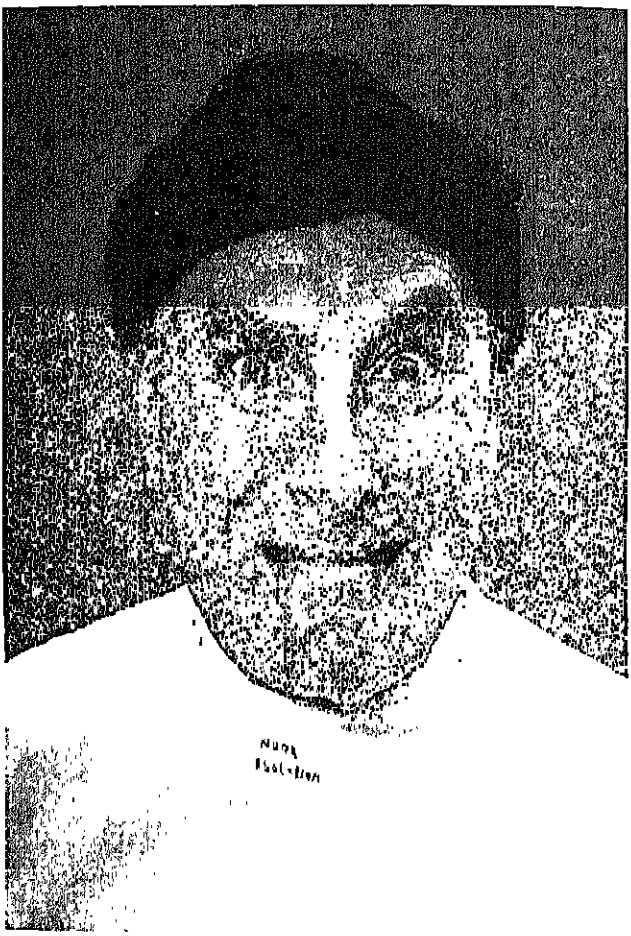

FIGURE 1

We then proceeded to investigate whether the response to the rictus stimulus obeyed the same laws as did the smile, namely disappearance on turning in profile and reappearance when turning back "en face" again.

We offered the infant our full face while rhythmically widening and narrowing our mouth. When the infant's smiling reaction reached its maximum, we slowly turned our head into profile, continuing at the same time the alternate widening and narrowing movements of the mouth. The infant immediately became serious, lost contact with the experimenter and often became upset. In some experiments head nodding was added to the mouth-widening movement, thus increasing the movement factor of the stimulus. Both movements were continued when we turned our head into profile. All the infant's reactions remained the same as above.

b. Discussion of Experiment 1. These results show that the *emotion* expressed in the human face has no significance for the smiling reaction of the child between its third and sixth month. The child's reaction is no sign of its understanding of the partner's emotional attitude. Whether smiling, speaking, nodding in a friendly manner, or baring its fangs in a terrifying expression of savage rage, the human face is seen "en face" and in motion remained for the child the signal of a human partner and was reacted to with a smile.

Though it has nothing to do with the question of recognition of emotions, such as love or friendliness in the human face, we introduced at this point another experiment for the purpose of clearing up a very widespread superstition.

Many profundities have been uttered about the magic power of the human eye. People have argued that the special quality inherent in the human eye manifests itself in the fact that even the smallest children are attracted to the eye more than to any other human feature. The objection, therefore, might be raised that the smile of the baby was provoked in our experiments by this mysterious power of the human eye.

We reasoned that if it were the human eye which has such power, one eye should be as good as two. So during the experiment, while the child was smiling at our smiling face, we covered up one of our eyes, continuing to smile or nod as we had done before. The child's face immediately lost its smile, became serious, even bewildered, and the child quickly lost contact. A film of this experiment was taken (Film No. 89).

2. *Experiment 2*

The second series of experiments was designed to remove the human attribute of the stimulus while conserving its configurational factors, in order to investigate the validity of the statement that the smile of the three-month-old infant is a reaction to a Gestalt-perception. In these experiments we pursued this idea to its logical conclusions. If the three-month-old smiles in response to a Gestalt-perception, and to a Gestalt-perception *only*, then there is no reason why this Gestalt-perception should be linked with the human being itself.

We, therefore, introduced a new experiment which consisted in covering our heads with a black skull cap and in putting one of the current Halloween masks over our faces (Figure 2).

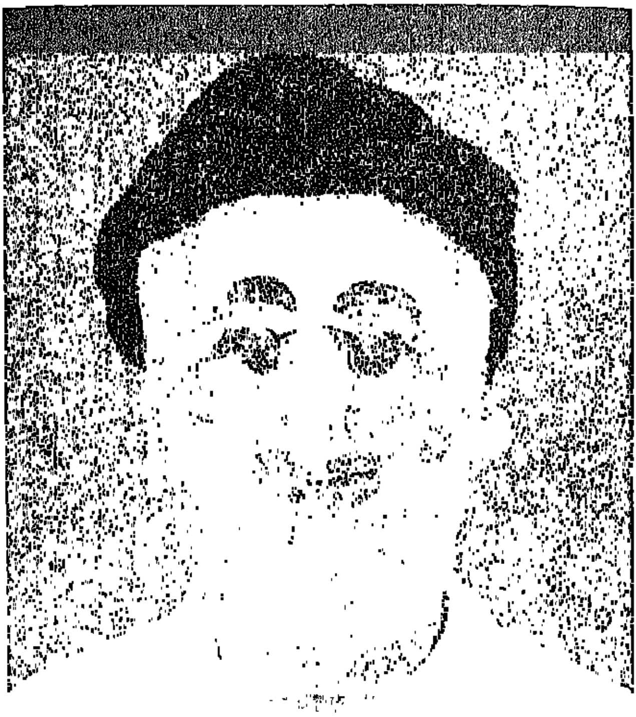

FIGURE 2

The mask, of course, could *not* smile. But, knowing from the previous experiment that smiling movements of the mouth can be effectively *replaced by any other facial movements, the experimenter presented his* face, covered with mask and skull cap, to the children, sticking his tongue rhythmically through the mouth-slit of the mask. When this experiment had proved completely successful in provoking the smile of the babies, the experimenter, still retaining the mask, replaced the tongue movements with a nodding movement of his mask-covered head. The children's reactions were the same as before: they smiled, laughed, or crowed, according to the individual child's inclination.

a. Results. The stimulus was presented to 142 infants between two and six months. Of these 140 reacted with a smile to the mask. Two (one aged 0;4+15, the other aged 0;5+12) who had reacted positively to the smile did not react to the mask. These two cases will be discussed further on.

b. Discussion of Experiment 2. Just as the previous experiment indicates that it is not the emotional quality of the mimic movements offered, but the Gestalt-quality which acts as stimulus for the child's smile, the mask experiment seems to show that this Gestalt-quality is not restricted to the human being's face or person. The reaction can be provoked just as well by a few colored pigments on a piece of cambric, as long as three essential conditions are provided: (1) the presentation must take place completely "en face," (2) two eyes must be shown, (3) the configuration must include the factor of motion.

We consider condition No. 1 as one of the most essential in the whole series of experiments. Both in the experiment of the mouth-widening and in that of the mask we included the additional variation of turning the head in profile. In both cases, as shown by all the films we have taken of those experiments, the effect is instantaneous; the child stops smiling, takes on a bewildered look, then either becomes serious or loses contact and looks away. It is obvious that whether it be a smiling human face, or a human face baring its fangs, or the face of a card-board mask, the essential Gestalt-quality which serves for recognition of a pleasurable stimulus for the child is that these shapes be seen "en face," and that the Gestalt consists of the *two* eyes, forehead and nose—plus motion.

The mask experiment should have been conclusive. But one school of psychologists in the past, in particular that of C. D. Broad, has in all seriousness tried to explain imitation and contact by "telepathy" beween the child and its partner. Even if one did not take this argument seriously, however, the objection might be raised that the human being hidden behind the mask is betrayed by the human, non-mechanical movement of the nodding.

3. *Experiment 3*

To remove this objection I constructed a primitive life-size puppet by stuffing a bag roughly into the shape of a head, attaching the mask to it and covering the top with the skull cap. A "body" was provided by hanging a dark shirt on a clothes hanger and fixing the artificial "head" into the collar of the shirt, so that it could be nodded (Figure 3).

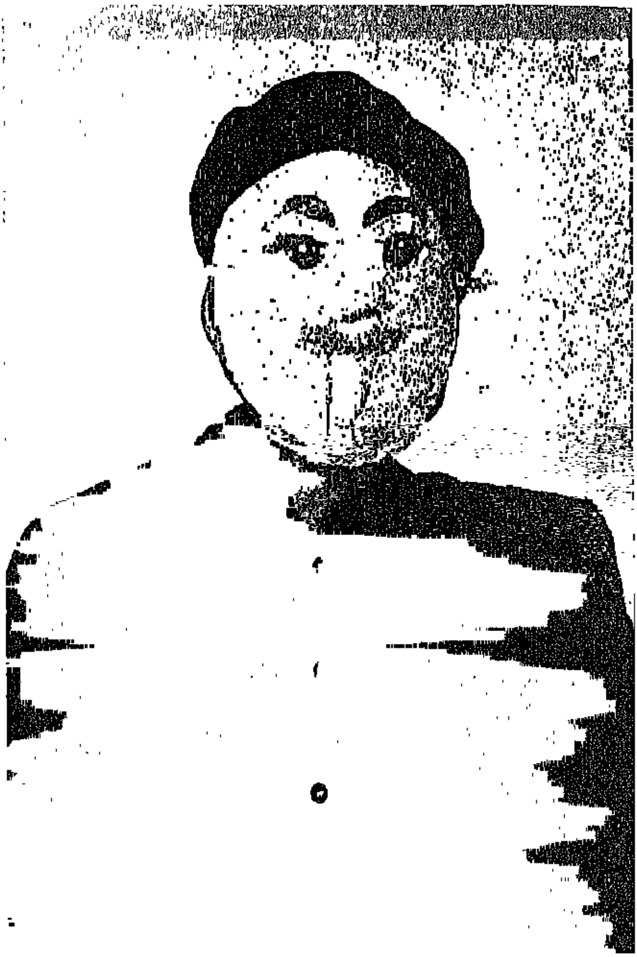

FIGURE 3

This scarecrow which really had nothing human in it was presented to the child by the experimenter who carefully hid himself behind the furniture at the foot of the cot. To our surprise we found that the very first time we applied this stimulus its effect seemed to be identical with the effect of the experimenter himself bending and smiling over the baby. The child greeted the nodding scarecrow by smiling, laughing, gurgling, or crowing in the same way as it had responded to the experimenter's smiling face in previous experiments (Film No. 90).[5]

C. Summary of Results of the Two Experimental Setups

Table 4 shows the results of our experiments.

TABLE 4

	Stimulus		
Response	Rictus	Mask on experimenter	Mask on stuffed head
Smile	141	140	140
No smile	4	5	5
Total	145	145	145

As will be seen from this tabulation we are again faced with an impressive total of positive reactions. It follows that during this age period discrimination between the recognition of the human face and the recognition of a mask has not yet developed except in a few rare cases.

D. Control Series

The extremely positive results achieved with the help of a stuffed, lifeless mask made it tempting to investigate whether there are any other lifeless objects to which the infant reacts with a smile. For the purpose of finding an answer to this question we made a systematic selection of material to be offered to the children.

The attributes of a perceptual stimulus which could elicit the smile of an infant can be roughly divided into the following categories:

1. *Intensity*. It could be that the child smiles to perceptual stimuli which are neither too strong nor too weak. We, therefore, offered:

a. A strong, a medium, a weak flashlight.

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[5] This article was about to go into print when Dr. K. Wolf kindly called my attention to the fact that Gardner and Lois Murphy (53), on page 251 of their book, *Experimental Social Psychology*, 1931, had suggested experiments with a mask for provoking the smiling response. To our knowledge this suggestion has not been acted upon.

b. A loud, a medium, a soft bell.

2. *Specific sensory quality.* There are several possible perceptual stimuli of a definite qualitative nature to which a child might respond. Warm colors and light colors and high-pitched sounds or euphonic sounds may be more likely to induce smiling than cold colors or dark colors and low-pitched sounds or noises. Color might be preferred to white, black, or grey; color combinations to uniform color. We, therefore, presented the child with a series of stimuli each of which offered one of these variations or a combination of several of them. To give only a few examples: (*a*) a musical rhythmical sound versus an unrhythmical and "disagreeable" noise, (*b*) red cardboard versus white cardboard, (*c*) rattles of different color combinations versus plain rattles.

3. *Surface structure.* It might be that the child prefers either a plain surface or a surface with a complicated structure. We, therefore, contrasted the stimulation of a shock of red knitting yarn with the stimulation of a smooth square of red cardboard of approximately equal size.

4. *Shape.* Conceivably, the child might prefer round objects to square ones, or pointed objects to objects without a point and that these preferred objects would be more likely to provoke the smile of the infant. We, therefore, presented the infants with objects of various shapes, such as: (*a*) a ball, (*b*) hollow blocks, (*c*) a bath thermometer.

5. *Size.* Finally, the effectiveness of a stimulus might be dependent on its size. Variations in size might modify its emotional appeal. We, therefore, offered the child objects of different size: (*a*) various sizes of paper, (*b*) colored blocks of different size, (*c*) red blocks of different size, (*d*) balls of different size, etc.

These stimuli were presented to each child by the male and by the female experimenter alternately. They were offered in such a manner that the experimenter could not be seen by the children; when no smile was elicited the stimuli were moved before the child by the hand of the hidden experimenter, so that the human element was present in the child's perceptive radius, although the experimenter's face was hidden. The hiding of the face, incidentally, is imperative at the three- to six-month level, because at this age the child's fascinated gaze often cannot be distracted from a human face by any toy whatsoever.

These experiments, which were made with all the 145 children in question, gave completely negative results. None of the children smiled on perceiving the toys. When their attention was captured by any one of them, their expression became concentrated and intent, but they never smiled.

These findings confirm prior statements of Washburn, G. Murphy, and Ch. Bühler to the effect that infants do not smile at their toys.

Since none of these perceptual variations led to a smiling response, we investigated whether it might be a subjective rather than an objective factor which transforms a stimulus into a smile instigator. We, therefore, investigated the frequency of smiling response in relation to degree of familiarity with an object. We first offered the child a completely new object, then we offered an object to which he was used to for many weeks, endeavoring to eliminate any possible spurious factors by selecting two objects as similar as possible. For instance, we offered the child its own rattle with which it had played almost throughout his whole life and contrasted this with an offering of an unfamiliar rattle. Neither the new nor the familiar object elicited any smile.

Even when we exaggerated the strangeness of the object by using one which the child had never seen before, a toy which did not resemble any of its own toys, a child under six months showed interest or attention at best, but never a smile.

We then proceeded to present the children with an object which we considered as having emotional significance for the infant. For this purpose, taking account of the importance of food in the infant's life, we used the nursing bottle (the great majority of the infants in question had been bottle fed or had received supplemental feedings from the bottle). Again the result was the same, with one important difference. In the more advanced children the bottle elicited a clearly recognizable sucking movement, opening of the mouth, stretching of arms and legs toward the bottle, squirming and sometimes babbling. The smile, however, was notably absent in this series of reactions.

We consider the negative result achieved in this experiment fully as important as the previous positive ones, because it disposes of several extremely plausible hypotheses on the cause and the significance of the smiling response.

The first of these is that the smiling response is a conditioned reflex, established in response to the gratification of being satiated by food. Darwin (19) and, after him, Freud (32) state that smiling appears for the first time in infants who, satiated, release the nipple. From our observations, smiling as facial movement appears independently of any peripheral stimulation. It does appear at a later stage in connection with the feeding situation; but whether as a result of feeding or of the other concomitant circumstances is a question which cannot be answered at the present stage of our knowledge. How are we to interpret, for instance, the behavior of an infant (Aurora), filmed during its nursing, who for several minutes nursed with complete absorption, then interrupted its nursing, smiled at its mother's face, started nursing again and repeated the behavior about a dozen times, relinquishing the nipple and taking it back in its mouth each time, making smiling a game between itself and the mother?

Gesell's formulation of the child connecting its mother with innumerable situations of expectancy appears to be more to the point. But in this statement the concept of the conditioned reflex is implicit. But, if response-smiling were a conditioned reflex, it would have to occur at least as impressively in response to the perception of the conditioner, food, as in response to the perception of the conditioned, the human face. Nothing of the kind occurs.

Translated into terms of Pavlov's dogs, it is as if the dogs who learned to salivate at the tone of the buzzer did not salivate when beholding the meat.

The other hypothesis we are now in a position to refute is the one which holds the smiling response to be the result of visceral excitation, the smile of another person being one of the adequate stimuli for such visceral manifestations (53). It is not evident from these authors' formulation whether by the visceral response they mean the response to food. If so, the hypothesis falls under the category discussed above. If, on the other hand, the authors mean by "visceral excitation" a syndrome of autonomous nervous system reaction plus glandular plus smooth muscle response, then we accept their hypothesis. In our opinion every emotional reaction of the living organism is concomitant with such visceral response, major or minor. In this respect the baby's smile is not different from that of the adult, and no precedence can be established at our stage of knowledge either for "visceral excitation" or emotional experience.

Since the mask experiment yielded positive results, it became apparent that another factor should be considered in its capacity to induce the smile: the similarity of the stimulus to a human being. Isolating this criterion presented something of a problem, however. As far as the mask experiment was concerned, the problem of size was the one factor which lent itself to modification. We, therefore, offered each of the children a small rubber doll (10") or one of the current 12" dolls, porcelain-headed. Neither of these dolls elicited the children's smile. For the most part, they introduced the doll into their mouths up to the fifth month; after that, they played with it.

Another problem intruded itself at this point. The films taken of the mask and of the scarecrow experiments are extremely convincing. Indeed, the joy of the infants on beholding the nodding mask, which for the grown-up would be a repulsive object, is so impressive in the films that one might feel inclined to conclude that the children find the mask funny and that they laugh for this reason. This assumption is disproved by two observations: (*a*) The child becomes serious when the nodding head of the adult with the mask on it is turned into profile (continuing to nod all the while). A mask in profile is not less "funny" than a mask "en face." (*b*) Knowing from the findings of this and other studies that at this age the child does not laugh at its toys and that, therefore, we could present a toy-like object without risking spurious factors, we offered our subjects a hollow block (3½ x 3"), which had funny faces depicted on each of the four sides. None of the children laughed.

IV. CONCLUSIONS

We are now better prepared to answer some of the questions posited at the outset of our experiments.

1. It can be stated that the child at this age is incapable of understanding and still less of evaluating the *expression* of the human face.

2. It is not the *human* face—its human quality—which acts as a stimulus. *The stimulus for the reaction is a configuration consisting of certain elements within* the human face, combined with motion.

3. It was found that racial, cultural, and environmental factors have a negligible influence, if any, on the reaction.

4. The present set of observations do not shed any new light on the *origin* of the reaction. We will, *therefore*, abide by Gesell's formulation according to which expectancies of a highly varied nature are set up in the infant in connection with this stimulus.

5. The significance of the inception time of this reaction will also have to be explained in a tentative fashion. In a recently published article (60) I have presented the hypothesis that up to its third month the child's perceptive system works along the lines of total perception, and that its perceptive organization follows the pattern of the autonomic nervous system's perception. In the course of its maturation and with the help of environmental stimulation, a progressively increasing number of elements are distinguished in the environmental perceptions. I have called this second mode of perception, which culminates in the adult's perceptive apparatus, the perception according to the diacritic system. The appearance of smiling in reaction to the human face and to the human only, is the first step in the development of diacritic perception (Appendix H). It is significant that this first step should be accomplished in response to social stimulation, in response to another person's face, and that it should be fraught with emotional significance. From our observations we can state that during the three to four months in which this reaction is present it changes imperceptibly in the direction of increased acuity of diacritic discrimination. Another way of expressing the significance of the smiling reaction is that its onset designates that level of the infant's development at which it becomes able to differentiate *"I"* from *"You,"* the subject from the object, his own person from other persons (and incidentally from objects without emotional significance).

6. After the sixth month the smiling pattern as a response to anybody and everybody disappears. The significance of this extinction follows from what we have said. It is a further, and immensely significant, step in the

differentiating diacritic discrimination. A similar view has been expressed by Murphy and Newcomb (53). In our opinion, the disappearance of the indiscriminate smiling pattern marks the beginning of differentiation between "friend" and "stranger." With this step the reaction to the "human being in general" has progressed to a reaction to the emotionally welcomed individual.

7. Therefore, the smiling reaction is an indicator of the emotional maturation of the child during its first half year. It informs us that the child is not only achieving mastery of perceptive discrimination and neuromuscular coördination of its mimic musculature, but that it is also progressing toward a finer differentiation of emotional reaction. It has become capable of distinguishing, within the chaos of its reactions, *some* which produce something different in the way of experience than did either the unpleasure[9] reaction or the attitude of quiescence in the neo-nate. It has become capable of relating such experiences to external factors. These external factors are in some way connected with a human partner. The coloring of the child's reaction to them appears to be similar to what we call pleasure in the grown-up. We may, therefore, say that the child has acquired the capacity to distinguish and to experience positive emotions.

This disappearance of the indiscriminate smiling response after the sixth month is a sign of definite progress in environmental discrimination and it is also an indication of further emotional maturation.

8. This throws light upon the significance we can expect from deviant patterns in the smiling reaction. These deviant patterns will show a distortion of the average emotional maturation and will act as a signal of an emotional disturbance. It is in the light of this that in the ensuing section of this report we shall examine the deviations from the usual smiling pattern.

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[9] We use the term "unpleasure" to describe the experience corresponding to the negative branch of the pleasure-pain principle. It seems to us that terms such as displeasure, pain, suffering, and discomfort which are currently used cover only narrow sectors of what is in reality one-half of all human experience. We, therefore, believe that a straightforward neologism like "unpleasure" stands a better chance of avoiding misinterpretation. This opinion is shared by Strachey (62).

V. THE EXCEPTIONS

The duration of the indiscriminate smiling phenomenon in its pure form is, as we have seen, strictly limited to a specific phase of infantile development, beginning approximately in the third and ending approximately in the seventh month. As a rule children do not respond by smiling to an indiscriminate smiling stimulation *after* the *seventh* month, while between the ages of three and five months 98 per cent of the children smile back at any smiling adult's face (Appendix I). There are, however, a certain number of exceptions to this rule which fall into the following groups: (*a*) age variations in the manifestation of the smiling response, (*b*) infants who smile at the human face but who do not smile at the mask (shortly after their fifth month), (*c*) infants who do not show the smiling reaction between their third and sixth month at all, (*d*) infants who react both to the human face and to the mask by screaming instead of smiling.

In discussing the individual variations we will have to change our method of approach. Up to now we have described a widespread behavior pattern. The large numbers involved enabled us to use experiments which could be standardized and evaluated by the statistical method. From here on we shall be concerned with infrequent exceptions which we will have to approach in a different manner, with the help of the clinical method. By its very nature the clinical method, in the beginning at least, does not function with statistical exactitude because of the small numbers it deals with. It serves, rather, as an orientation to the peculiarities of the phenomenon. Subsequent observations of large numbers of exceptions will have to provide us with statistically relevant regularities. At present we shall be able to study the modifications of the general pattern only in terms of individual differences. These individual differences fall into two classes: the endowment of the given individual, and the environmental influences operating upon it. In both cases the understanding of these deviations cannot be gained from experiments, but only by an investigation of both the actual and the past environmental factors operative in the case of each child. We shall, therefore, proceed by illustrating our examples with case histories.

A. Variation I: Age

1. *Early Appearance*

The early appearance of the smiling reaction seems to be a concomitant of a generally advanced development. We have closely observed one such case up to now. This is the case of a female infant, *Adonia,* who at the age of

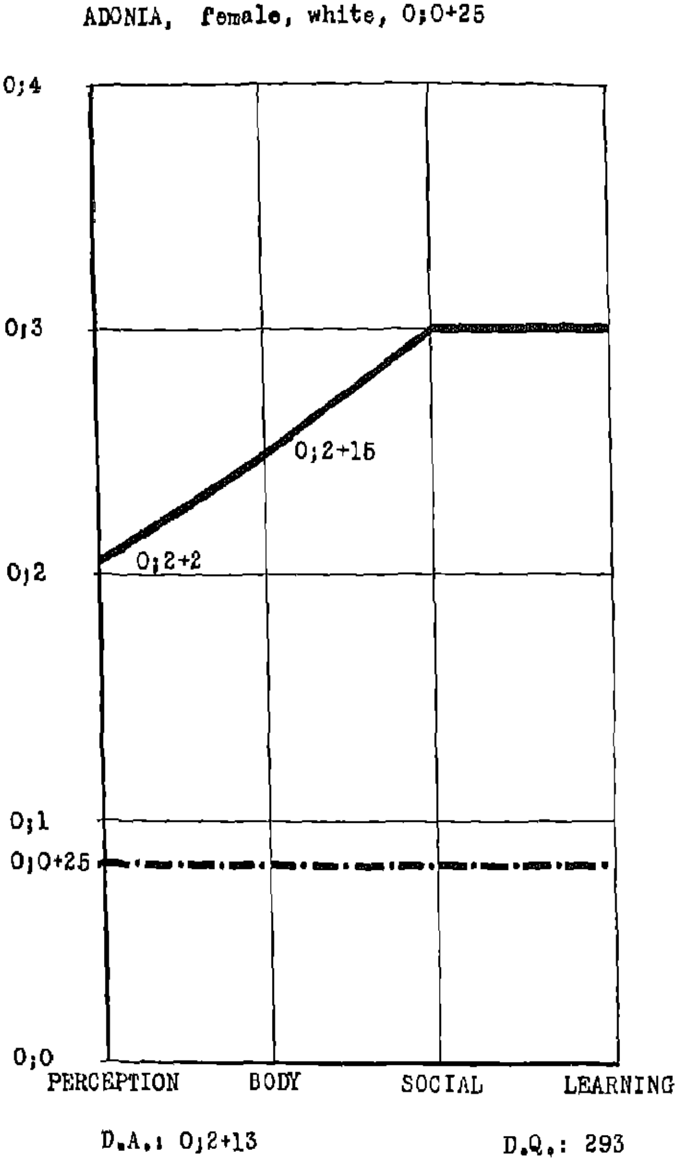

FIGURE 4
A horizontal line of alternating dashes and dots indicates the chronological age of the child. The developmental level in the different sectors is indicated by a heavy continuous line. The scale at the left side gives age levels in months. *DA* is the developmental age. *DQ* is the developmental quotient.

0;0+25 showed the smiling response to the smiling grown-up's face. We were so impressed with this exceptionally early reaction that we filmed it for our records. At that time the child was generally advanced by one month and 18 days over its chronological age (Figure 4).

We observed this child up to the age of 0;11+19. It remained consistently in advance of its chronological age and at 11 months and 19 days of age was four and one-half months advanced (Figure 5).

Her most striking advance was in the intellectual sector which usually begins to play a rôle only after the eighth month. Intellectually, Adonia was nearly four months in advance of her age. We believe that this finding is an excellent confirmation both of our hypothesis of the pioneering rôle of

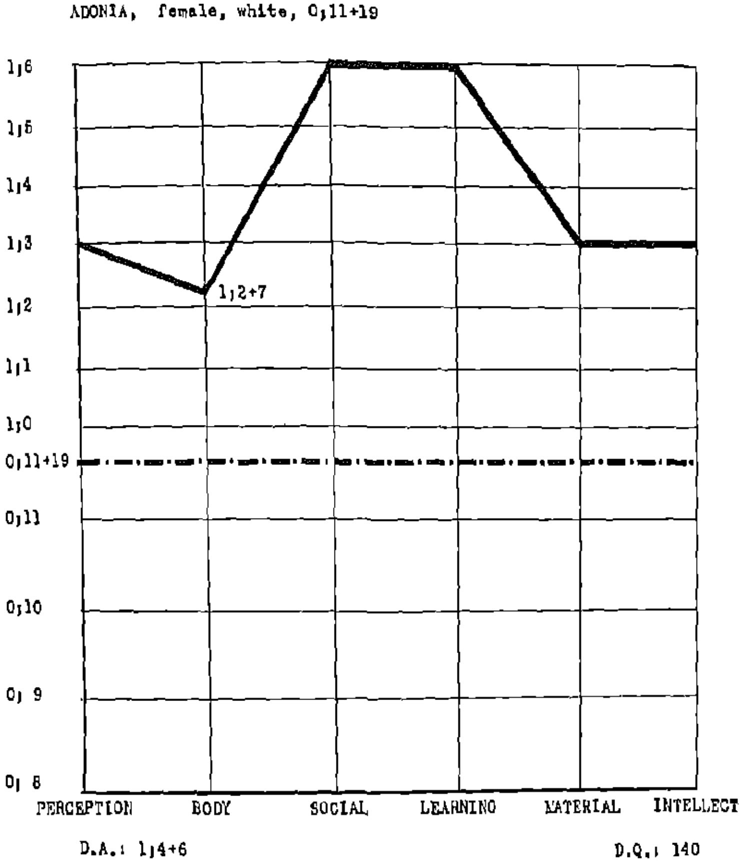

FIGURE 5

emotional relations in general development and of the significance of emotions for every human activity, be it perception, physical proficiency, memory, inventiveness, or understanding. It is perhaps relevant to add that this child had a Latin background and an unusually pleasant and devoted mother.

2. *Unmodified Persistence of the Smiling Reaction After the Sixth Month, or Its Belated Appearance After This Period*

We have observed this phenomenon in institutionalized children with severe general developmental retardation.

B. VARIATION II: SMILING AT HUMAN FACE BUT NOT AT MASK

Shortly after their fifth month infants sometimes smile at the smiling experimenter's face, but do not smile at the mask. These cases are very infrequent, and we have observed them only in children in private homes, where relations between mother and child were particularly good. In this study there were two cases of this behavior: Robert at 0;4+15 and Debora at 0;5+12. Both were first-borns in private families of upper class professionals. Each of these children represents the fulfillment of their mothers' highest aspirations. Each of the two mothers felt that their child was not only a supreme accomplishment, an extraordinary fulfillment of their personality, but *the* crowning achievement of their lives, ranking higher than any other of their many social and professional achievements. I believe that we can consider this type of smiling response as an advance[7] in discrimination above the usual age level. This particular type of smiling response shows that these two children had already reached that stage at which they distinguish the human being from the inanimate object. They thus reserved social behavior for the human being only, and excluded the inanimate mask from this privilege. It is perhaps not without significance to mention in this connection that in both cases the father was also very much attached to the child and gave it more than the usual share of attention.

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[7] It cannot be sufficiently stressed that the term "advance" is used here exclusively to denote a departure from a developmental average. Whether such an "advance" represents also an *advantage* is open to question, to say the least. It may just as well be a serious disadvantage for optimal further progress. Whether it develops into an advantage or a disadvantage depends on numerous factors, of which the age level at which the advance is manifested, the personality sector which it involves, the immediate causes which have provoked it, and the environmental reactions to it are but a few.

C. VARIATION III: NO SMILING REACTION

Infants who do not show the smiling reaction between their third and sixth month at all fall into three classes.

1. *Negative Reaction Because of Lack of Perceptive Development*

This is the rule from birth to the end of the second month at least. In this period the infant is incapable of fixating a visual object, does not fixate the human face offered to it and cannot be brought to fixate it. The infant's reaction to the stimulus of a human face is uncoördinated, undirected, and diffuse in the same manner as its response to all other stimuli. The response (or rather the diffuse movements plus lack of response), therefore, is an overflow reaction and not a perception. When this lack of directed reaction continues after the second month, it becomes of diagnostic significance for general retardation.[8]

2. *Negative Reaction: the Infant Fixates the Grown-up's Face, But Does Not Reciprocate the Smile*

This can obviously only occur after directed reaction to visual stimuli has been acquired. This is the only reaction which could be considered truly negative. In such a case the infant concentrates his gaze on the smiling adult's face, often even frowning while carefully watching the adult's facial activity; it may sometimes have a puzzled expression, but it will not return the adult's smile. This negative reaction is also of diagnostic significance, but as we shall see its significance differs from that of an absence of reaction due to absence of perceptive development.

Cedric at the age of 0;3+4 had a general developmental quotient of 147, which means that he was developmentally advanced one and a half months beyond his chronological age (Figure 6). An exception to this advancement is found in his social relations. There he is retarded below his chronological

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[8] Edouard Pichon in his book, *Le Développement psychique de l'enfant et de l'adolescent*, Paris, 1936, is, to my knowledge, the only observer who has ever correlated the absence of the smiling reaction in the baby with lack of emotional development. It is regrettable that the excellent clinical observations of the author should be marred by an insufficient familiarity with current and past psychological work, as well as by his tendency to build theoretical assumptions on an inadequate basis. The insight he has achieved into this particular element of infant psychology is interesting. He considers a clinical picture which shows a lack of emotional development (which he calls *agénésie affective*) to be the precursor of deepest idiocy which manifests itself in the later development of children who suffer from it. It is of little importance that his explanation of *agénésie affective* is erroneous or at least insufficient, for he assumes that the only reason for this phenomenon is the inequality in the psychic and emotional endowment of individuals. As we will show later on, this is only one of many reasons for this phenomenon and a minor one at that (55, p. 35).

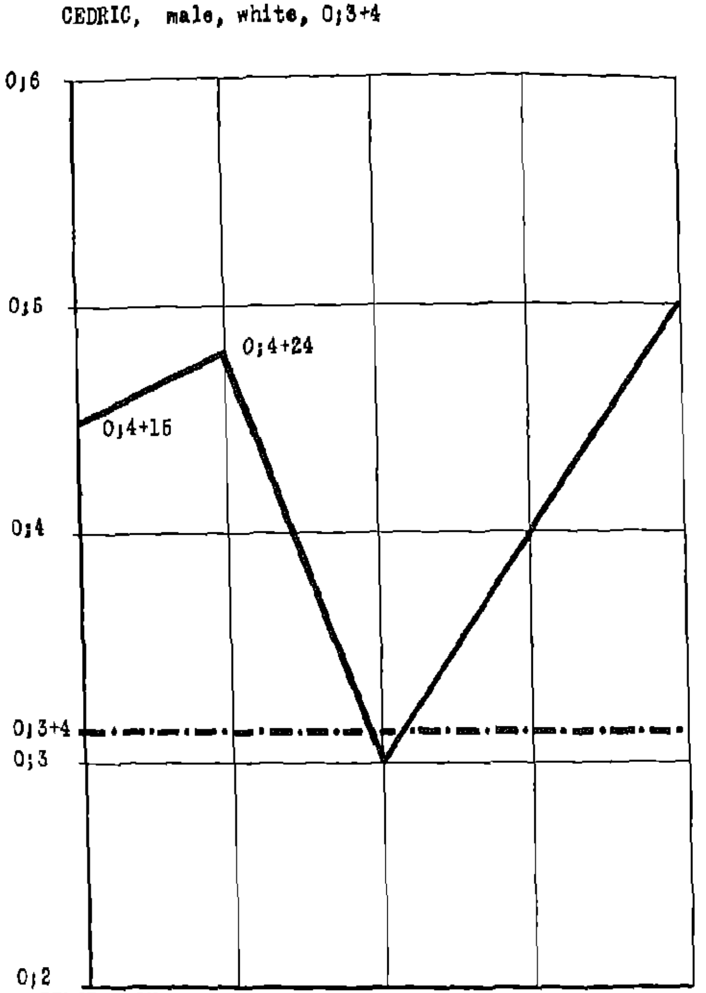

FIGURE 6

age. He had failed to perform the test for the third month in the social sector, which consists in reciprocating the grown-up's smile. He manifested the behavior described previously. He looked very attentively at the smiling grown-up's face, frowned but did not smile. This retardation in the social field was still apparent when we tested Cedric again at the age of 0;4+4, 0;5+16, 0;6+8, and 0;7+13 (Figure 7).

The chart of his development on each of these occasions is so startlingly

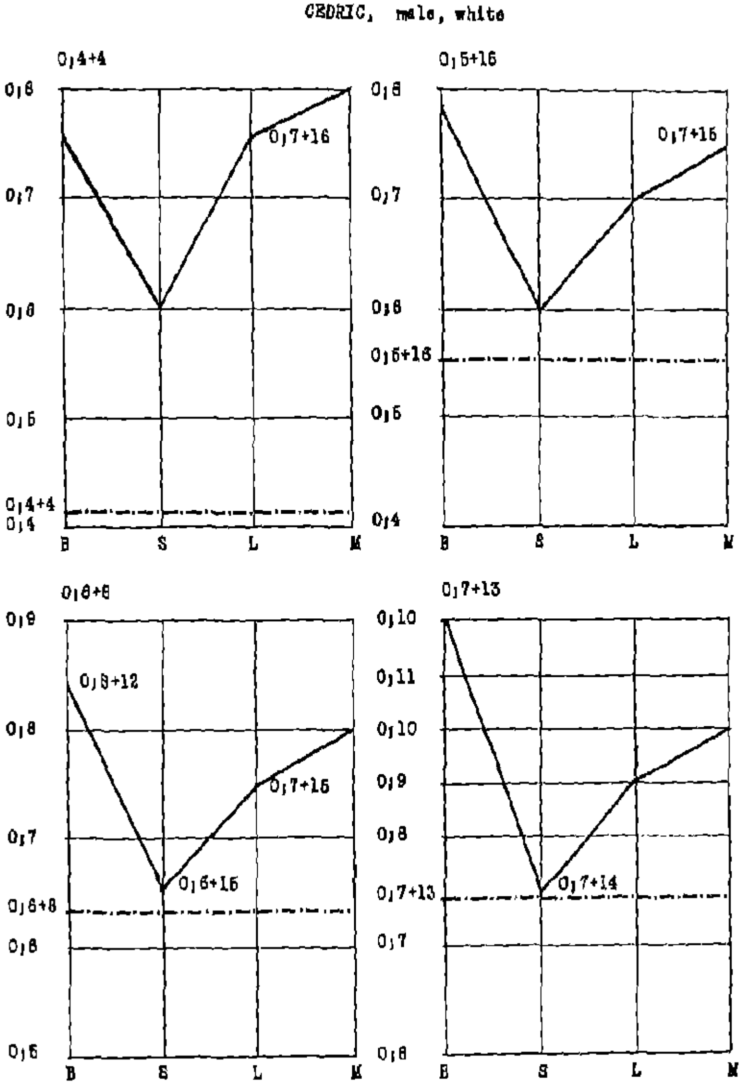

FIGURE 7

similar to the previous ones that they could be superimposed upon each other: relative retardation in the social sector, unusual advancement in every other sector of the personality. A quotation from the protocol taken at 0;6+8 is very characteristic:

> Cedric's reaction to the grown-up is that of interest and objective observation. The grown-up is an object to look at and to study; his reaction to this stimulus does not differ from that to other stimuli, except that for him the grown-ups are the means to get play objects, the things he wishes to have. He has no real social reaction. It had been previously stated by the mother that the grandfather was the only person in Cedric's world who had been able to induce him to smile. Even now his smile, which occurs very rarely, is extremely superficial.

The child was observed by us until the age of one and a half years; at the age of one year he had learned to smile and to be afraid of the grown-up, but his social reaction remained extremely retarded. We quote from the protocol taken at one year:

> Cedric is intellectually very advanced and completely asocial. He now expresses a longing for social contact but it is one-sided. He is not capable of any organized games, he always takes, but never gives.

Reciprocity on a primitive level appears in the normal child at eight months. A higher level of reciprocity with adults is normally achieved soon after the 12th month; but since his general developmental level is that of a 14-month-old child Cedric's absence of an understanding of give and take in social relations is a striking phenomenon.

The environmental background of Cedric provides an explanation for his unusual emotional behavior. Cedric's parents are intellectuals who have absorbed everything currently en vogue pertaining to the way good parents should behave with their children. On the other hand, both of them simmer with hostility, repressed and sometimes not so repressed. The mother's hostility is unconscious but ever present, overlaid with a slightly acid, syrupy veneer of sugary small talk. One of its overt manifestations is her solicitous, somewhat anxious attitude. The father's hostility is overt and more explosive, partly due to his character, partly to the fact that he has to concentrate it into briefer periods of contact with the child. When we saw him, he came in, blustering, and began immediately to perform exhibitionistic stunts with the child, picking it up and swinging it around on his shoulder with a lighted cigarette in his mouth; he narrowly missed burning the child, upsetting the mother greatly, and showed no insight into the inappropriateness of his behavior. The grown-ups in this child's environment were much more eager to use him for their own exhibitionistic and narcissistic purposes than as a love object. Under the circumstances it was not surprising to find Cedric at the age of 1;6+0 playing with the two experimenters happily, though without particular friendliness in the absence of his mother, and exhibiting a tense and hostile expression on his face and uttering screams of rage and anger at the mother's approach.

The other child who refused to return the smile of the grown-up between the third and the sixth month shows environmental factors similar to Cedric's. We conclude that the absence of the smiling response is definitely not a sign of retardation, because it is compatible with greatly advanced behavior in every other sector. It is characterized by a tenseness in the expression of the child and we suspect that its diagnostic significance is one of psychiatric involvement in the emotional field, though we are not prepared to say at this moment how far this psychiatric involvement goes, or what its nature is.

3. *Lack of Interest in the Stimulation Offered by the Adult's Face*

These cases are rare. It is hardly possible to get contact with these children by offering them a smiling face. They react to it either not at all, by looking at something else, or they take a brief look at the adult's face and just look away from it indifferently. It is still harder to get their attention a second time. The contact is just as fleeting and no smile is evoked. This is a reaction which we have found in some children suffering from hospitalism (61). We believe that this is a deeper disturbance than the previously described one. Emotional contact with such children is nearly impossible. Those are the ones who present the factors described by Pichon as *agénésie affective*. They have never reached the developmental level of an emotional reaction either to an instinctual or to a social situation. Their emotional reactions are in response to their own narcissistic experience, and take place in accordance with the pleasure-pain principle. Even this statement is possibly an exaggeration. They do not show pleasure at anything, their emotional behavior is actually along the lines we have described for the new-born. Environmental stimuli either leave them indifferent and quiescent, continuing to be absorbed in their own concerns; or they are disturbed by them and react with more or less violent emotional manifestations such as screaming. It would perhaps be more correct to say that they function in accordance with the pain-quiescence principle.

D. VARIATION IV: SCREAMING INSTEAD OF SMILING

These children show a rather puzzling picture. When the observer approaches them while they lie quietly and pleasantly in their bed, often playing with a toy, they mostly react with a look which in an adult would be called one of suspicion. If then the experimenter bends over the child and speaks to it smilingly, it either looks at the experimenter with a distinct expression of mistrust, which in a few seconds turns into crying, or it immediately starts to scream violently. It is perfectly obvious that the experimenter is experienced by these children as a very disagreeable stimulus. The moment the experimenter steps out of the visual radius of the child it quiets down and sinks back either into pleasant contemplation or contented playing. That these children wish the experimenter to be removed immediately is unmistakable.[9]

The case of Evamar (WF W15) is a particularly instructive one. The mother of this child is detained in prison and the child was raised from birth in the prison nursery. The conditions prevailing in this nursery are unusually good ones as compared to institutions in general (61). WF W15 is a well-developed infant with a developmental quotient of 117. An investigation of her background disclosed that the mother has an intense passive homosexual attachment to another prison inmate. The latter was a girl with a violent, domineering, rebellious personality who was constantly instigating her prison mates to revolt while treating them alternately with caresses and blows. We will call her the ringleader. As a result of this emotionally upsetting relationship Evamar's mother behaved in a resentful, non-coöperative manner, was bitter, and rejected all advice in regard to her child. This background was investigated because we were trying to find the reason for Evamar's unusual response to the smiling stimulation. When approached by the experimenter at the age of 0;4+13, she screamed instead of producing the normal smiling response.

0;4+20: The reaction was not changed. At this point the head matron of the nursery undertook a psychotherapeutic intervention, consisting, on one hand, in a brief discussion of her attitudes with Evamar's mother and, on the other, in an environmental manipulation, consisting in the removal of the domineering, rebellious ringleader to another building of the prison.

0;4+26: The child suddenly showed a perfectly normal smiling reaction to the observer's face.

0;5+4: The same reaction was observed and filmed.

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[9] The behavior of these cases is reminiscent of some speculations of the English school of psychoanalysts on the rôle of screaming in the infant (56, pp. 193-205).

A fortnight passed; the disciplinary measure inflicted on the ringleader was lifted and she returned to the nursery part of the prison.

0;5+18: The smiling reaction disappeared. Evamar screamed violently at the approach of the examiner and quieted down when the examiner withdrew. It was learned from the matron that the mother had again taken up her relationship with the ringleader to the extent of participating in an attempted riot, which was nipped in the bud.

The matron again discussed the situation therapeutically with Evamar's mother who became penitent and showed attachment to the matron to the extent of bringing her baby to show how well she was treating it.

0;5+25: The child was again examined and showed a reaction on beholding the experimenter's face which was neither screaming nor a full-fledged smile. It was rather a sort of vacillation between a smile and an expression akin to anxiety, but which on the whole was nearer to smiling.

Films were made of some of these reactions (Nos. 224, 229, 241). It is obvious even to the most casual observer that this child was emotionally disturbed and that her emotional disturbance paralleled closely the ups and downs of her mother's emotional vagaries. In this particular case this need not further surprise us, since one of the ringleader's peculiarities was that she asserted her domination over the mothers by forcing them alternately to neglect their own children and look after her child, allowing them, if the fancy took her, to show kindness again to their own children. Small wonder that Evamar found herself confronted with insoluble emotional problems.

A protocol taken *four weeks later* shows the factors operative in the child's behavior with particular clarity.

0;6+23: The child was approached by one male experimenter and two female experimenters. She immediately started to cry. The child could not be reassured and, therefore, the three of us left the room; the crying subsided.

Two minutes later: The male experimenter returned alone. The child, still crying a little, was quite ready to take up contact with the male experimenter and responded with a smile as long as he remained alone. When two female prison inmates appeared in the doorway, the child started to scream again violently.

The male experimenter now left the room. The mother took the child to the diapering room. After quite a while the child quieted down.

Ten minutes later: The male experimenter returned and in the presence of the child's mother elicited the child's smile without difficulty. The experiment was interrupted.

Two minutes later: The two female experimenters were then sent in and approached the child with smiling faces. The child immediately reacted with screaming. The experiment was interrupted.

Two minutes later: One female experimenter was sent in to the child. Again the reaction was crying but the screaming was not as violent as when two female experimenters had approached the bed.

Five minutes later: The now quiet child was again approached by the male experimenter whom the child greeted with a smile.

Ten minutes later: The female experimenter was sent in to the completely quiet child. The child immediately started to cry and the more the female experimenter tried to reassure her, the more the child cried.

A few words of explanation are in order. The striking difference between the child's reaction to the male experimenter as contrasted with that to the female experimenter is understandable since in this nursery the children did not see any other men. The upsetting experiences of the child were connected with its mother and the ringleader, not with males. We must assume that the child, who had been seeing my face from week to week in connection with agreeable experiences such as social contact, reassurance, petting, and toys, was at the age of six and one-half months, able to differentiate it from female faces with which emotionally disturbing experiences had been connected.[10]

It appears, furthermore, that this child was not only able to differentiate the measure of gratification offered by the male as contrasted with the female, but that it was even capable of realizing that two females, i.e., his mother plus the ringleader, are more painful than one. This is manifested in the much more violent rejection of two female experimenters than one female experimenter.

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[10] The early appearance of this discriminatory capacity concords with my frequently stated opinion that painful experiences during the first year are, within limits, the basis for the acquisition of mastery and developmental advance. This child had its fill in regard to painful experiences in the social sector and we do not think it surprising, therefore, that it should manifest an advance in this sector.

VI. GENERAL CONCLUSIONS

We have demonstrated the phenomenological conditions of the smiling response of the baby. The rigidity of these conditions has misled one of the previous observers, Kaila, to postulate that the smiling response is a stimulus-response process to a stimulus of purely Gestalt character. In making this assumption, he has—as is the general tendency of formal Gestalt psychologists—neglected the fact that the phenomenon has a history. The significant point in our investigation is not the proof of the specificity of the stimulus and of its purely configurational character. The real significance is to be found in the deviations from the general pattern and is particularly well illustrated by deviation No. 5, Film 224 (Case: Evamar), in which emotional disturbances of the child's mother result in a reversal of the reaction. It must not be assumed, of course, that every emotionally disturbed mother will induce the same kind of reaction-reversal in her child. Though the gamut of possible reactions in the course of the first year is very limited, still the infant has many other possible patterns for reacting to emotional traumata, such as eating difficulties; psychosomatic disturbances (in the nature of digestive troubles, skin diseases, etc.); developmental disturbances such as retardation or acceleration, as the case may be; tantrums, changes in the activity pattern, and so on.

We have also to explain why we call this phenomenon a "reversal" rather than a negative reaction. The smiling response of the baby is proof that it perceives and recognizes the stimulus offered to it. It recognizes the grown-up as an object which is somehow different from the other objects in its environment. A negative reaction takes place when it either does not perceive or when it does not react to the stimulus. When (as in the case of Evamar) the child begins to scream on perceiving the stimulus and permits itself to be reassured only on withdrawal of the stimulus, then it has both perceived and recognized the stimulus. We, therefore, cannot call the reaction a negative one. The stimulus still provokes an affect; it has merely changed from positive to negative. The screaming proves that the baby has distinguished the grown-up from inanimate objects of its environments just as reliably as if it had smiled. In other words, instead of pleasure, the stimulus evokes unpleasure. Therefore, we call this reaction "the reversed smiling response."

It was most impressive to observe that this reaction (in the case of Evamar) took place in response to the approach of any grown-up during the time the mother was emotionally unbalanced, that a brief psychotherapeutic intervention by the matron, relieving the mother from her emotional tension, resulted in a completely normal reaction within one week.

At this point the realization that the configuration stimulus fulfils only the rôle of a signal, the signal of an emotionally cathexed experience, becomes inescapable. That this experience is the signal of the approach of another human being and, therefore, belongs to the category of social experiences is not difficult to see.

The question now arises whether the concept "another human being" is an acquired one or whether it is pre-formed after the manner of an *Anlage*. We have shown in our study that the infant manifests its recognition of "another human being" by smiling. When, therefore, we investigate what the concept "another human being" means to the infant, we will try to ascertain the function and origin of smiling. For this purpose we will have to divide the phenomenon of the infant's smile into two distinct categories. The first category is that of the motor pattern of the smile. The second category is that of the function to which the motor pattern of smiling is put in the service of semantic facial expression.

There can be no doubt but that the motor pattern of smiling is present, if not at birth, then at least as *Anlage* which is manifested in the first days of life without any environmental stimulus for its provocation, as already mentioned.

The pre-formed motor pattern, however, is used by the child in a specific social situation beginning with the second month. At this point what was previously a motor pattern devoid of meaning takes on a new function. It is integrated on a higher level into a pattern syndrome embracing the motor pattern on one hand and a psychic pattern on the other. On this new level, a psycho-motor level as it were, it becomes autonomous and independent from the previous motor pattern. On the psychomotor level the pattern syndrome invariably shows a vast preponderance of the psychic factor over the somatic factor.

On this basis we can say that the motor *Anlage* of the smile after the second month is integrated into the nascent pattern of the child's emotional needs on the social level. In the course of this integration the purely motor pattern of the smile is endowed with the psychological meaning inherent in the child's emotional relations with its human partners. In view of this significance of the smiling pattern in interpersonal relations we feel justified in calling it a pattern used for semantic purposes, in short a semantic pattern. The next question is whether this semantic pattern is also to be considered as an *Anlage* like the motor pattern. This is a question, however, which at the present stage of our knowledge cannot be conclusively answered. There are very valid reasons which speak against the *Anlage* hypothesis, but we cannot exclude it completely.

It might be argued from the very small number of exceptions to the cases presented by us and from the great difficulty encountered in influencing the pattern of the social smile that it must be an inherited *Anlage*. The fallacy of this reasoning lies in the fact that in the course of the phylogenesis of every species certain environmental conditions have become established which are extremely difficult to modify. It might be interesting for instance to investigate whether fish spawn would not develop a different method of respiration if raised outside of water. That this is not mere facetiousness is shown by the experiment of Piaget who proved that snails raised in a modified environment (mountain environment instead of lake environment) also modified the shape of their shell. But in the case of fish spawn the experiment is unfeasible, because the fish will die before we can find out.

It is difficult to change or modify an environmental condition in the infant's life in the presence of the parent, the mother in particular. Infants *have* to be fed, nursed, cared for, and raised by other human beings. It is extremely hard to introduce sufficiently significant modifications into this process without destroying the infant. This fact explains the scarcity of cases in our material in which deviations have taken place. It appears that very specific modifications of the mother's attitude are necessary in order to effect enough of an environmental change to produce an observable modification of the child's social reaction.

Another factor also has to be taken into consideration. If we may be permitted to speak somewhat metaphysically of the urge to live, then we may say that at birth very little of this urge appears to be present in any organized fashion, but that it develops powerfully in the course of the first few months; once developed, it pursues those alleys which seem to promise its gratification with incredible tenacity. The lines along which the urge to live appears to develop are those of security and assurance of gratification of various needs such as hunger, thirst, comfort, and warmth. All these are insured by the presence of the human partner. Once the road to contact with the human partner has opened for the infant it will pursue it regardless of disappointments and obstacles, with that incredible tenacity which characterizes the urge to live. To discourage this tenacity in the pursuit of social contact, once it has come into being, would again require deep and fundamental modifications of the general environment.

These two factors, the difficulty of modifying living conditions of babies in general on one hand, their tenacity in extracting what they need for living out of the most unfavorable situations on the other, explain the small number of exceptions we have found. We do not doubt, however, that, if experiments in the isolation of children after the manner of Dennis (24, 25), Bakwin (4), and Gesell (34) should be performed in sufficient number, we would easily find a much larger number of such cases. The trouble is that like the fish raised without water, most children put into such modified conditions will die (61). There are a few who, through a special combination of circumstances, were subjected to a modification of environmental conditions specific enough to change the pattern of social smiling, but not so severe as to be fatal. These we deem to be particularly instructive in regard to the measure and nature of psychic trauma causing psychiatric disturbances.

We shall now proceed to investigate the factors which in our opinion speak against the assumption that the semantic smiling pattern is an *Anlage*.

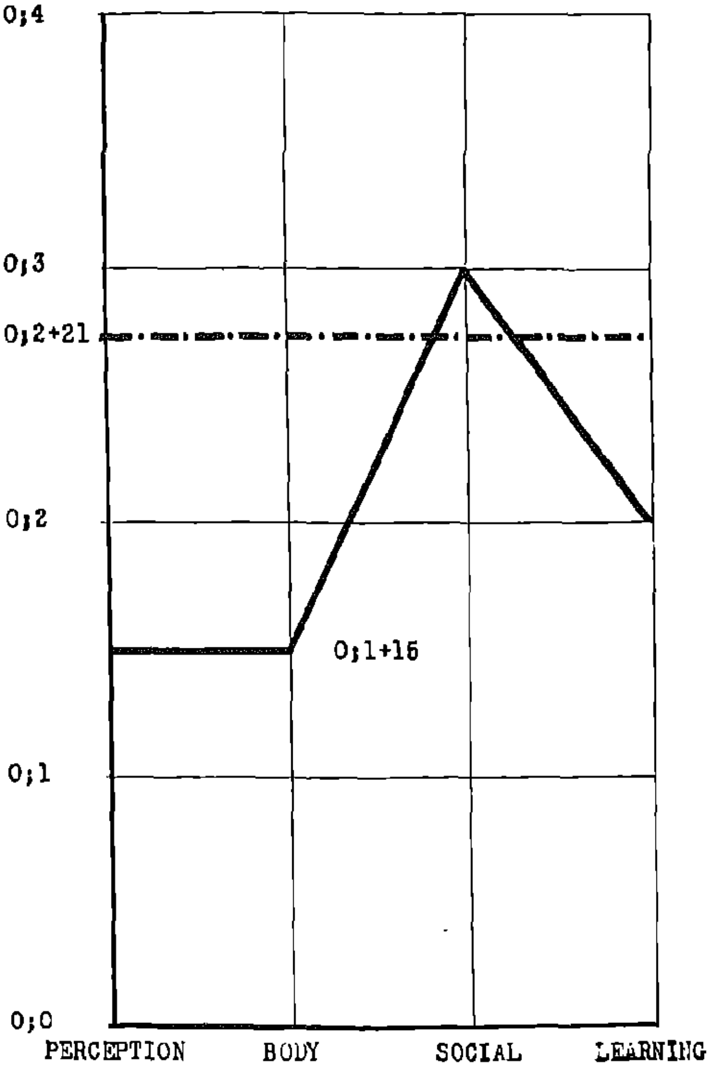
First of all, in the first two or three months the child does not smile at another human being. Lack of response during this early period is not conclusive; it might be argued that at birth smiling is present as an *Anlage;* that it is preformed, but will emerge only in the course of later development. It would then follow the laws of such developmental patterns as established by McGraw in her co-twin studies (49).

That such is not the case is shown by our material in two ways, by individual cases on the one hand and by the fact that there are exceptions to the general appearance of the smiling pattern on the other. In individual cases, the most well established *Anlages* are, of course, to be found in the sector of perception and bodily development. As demonstrated by McGraw (49) the rate of development of phylogenetic patterns cannot be influenced either by exercise or other environmental factors, whereas acquired skills are easily amenable to such influences. The case of Konro is very convincing from this point of view:

Konro was born two months before term. The mother is a very well adjusted person who had no difficulty in accepting her rôle as a mother. Accordingly the mother-child relationship was excellent.

At 0;2+21: The child was tested and showed a retardation of six weeks in the perceptive and in the body mastery sectors, sectors which we consider, on the basis of our observations, to be pre-formed at birth (Appendix J). In other words, in those sectors which we consider as *Anlage,* and which, therefore, are not influenced by environmental factors, this child had a developmental retardation which corresponds approximately to its two months prematurity. In the sector of learning, in which environmental influence

KONRO, male, white, 0;2+21



D.A.: 0;1+24 D.Q.: 67

FIGURE 8

and *Anlage* share, the retardation was four weeks. But in the sector of social development, where at this age smiling is one of our tests, the child showed the performance of a three-month-old child. It had progressed beyond its actual chronological age in this sector, thanks to the particularly good mother-child relationship. The fact that this good relationship could influence the smiling pattern, but could not help body mastery and perception to make up for the retardation caused by prematurity shows that the smiling response is not an *Anlage* but an aptitude acquired in response to environmental factors (Figure 8).

It is perhaps worth mentioning that later on this child not only was able to make up the handicap of two months retardation in the pre-formed sectors, but at 10 and 11 months of age had achieved an actual advance beyond his age in these sectors.

The second argument against the smiling response being an *Anlage* is to be found in Variation No. 4. A number of children, not large but still significant, do not smile at all in response to another human being's stimulation during the critical period of the third to sixth month.

This lack of response can be understood by a somewhat closer analysis of the concept "another human being" ("a partner"). As previously stressed, the early establishment of such a concept in the child's mind, the segregation of the human stimulus from the mass of environmental stimuli at an age when no other stimulus is so segregated, requires an explanation. In the nursery situation the stimulus "another human being" is provided exclusively by the mother or by the mother substitute; we will, for simplicity's sake, include also the latter when we use the term, "mother." This mother provides the child with all the pleasant stimulations and experiences without exception.

Of course, the relationship between mother and child does not start with pleasant stimulations. As mentioned previously, the neonate is incapable of perceiving pleasurable stimuli. The first stage of relations between mother and child is, therefore, the stage in which the mother provides relief from discomfort. This is of cardinal importance during the first weeks of life. Insensibly, the relief from discomfort merges with the experience that the mother's presence ensures security, freedom from suffering. From here, it is only one step to the stage at which the child perceives the pleasurable quality of some stimuli offered to it by its mother's presence. When this third stage has been reached, it becomes understandable that the reaction to the mother's presence will be the same as that which is produced from there on to all and every pleasurable stimulation in the course of life.

These three steps: relief from discomfort, assurance of security, and tendering of pleasurable stimulation are accomplished as a consequence, and with the help, of the mother's ministrations while nursing the baby, keeping it clean, washing it, diapering it, and fondling it. The situations in which the infant experiences the mother's proximity while looking at her face are literally numberless. The films we have made of nursing babies are very revealing in this respect. The nursing infant does not remove for an instant its eyes from the mother's face until it falls asleep at the breast, satiated (Figure 9).

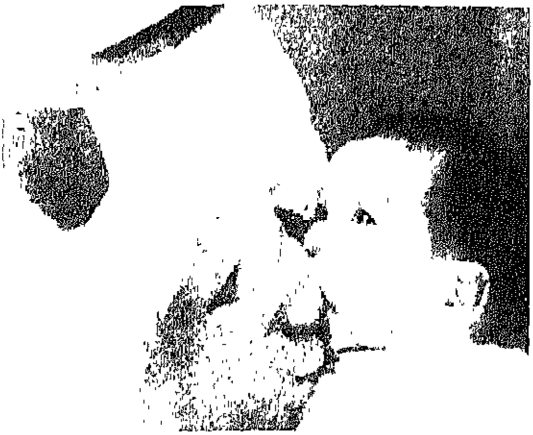


FIGURE 9

This visual contact is however, only one sector of the total experience. There are the other senses also, of varying degrees of importance. We believe, for instance, that the sense of smell in the human infant has no deep significance—at least the experiments of Canestrini, Ripin and Hetzer, Frankl and Rubinow make it appear so. What the situation is in respect to the sense of taste is as yet insufficiently explored. We feel that certain reactions of children in connection with weaning show that at the age of six months, at least, a very delicate discrimination in the field of taste may be present. The sense of hearing also plays an important rôle; according to other authors (Ch. Bühler, H. Hetzer, Tiedemann, Jones, Gesell, Dearborn, Brainerd, Shinn) acoustic stimulation is one of the earliest to provoke the baby's smile. Little or nothing has been done to investigate this area up to now.

There is another sector of the perceptive field which in our opinion plays a very important rôle during the first trimester. That is the tactile sense and *its little explored next of kin, the sense of equilibrium and the* sense of vibration. Here again many authors (Watson, Blanton, Ament, Major, *Dearborn, Darwin, Shinn) can be quoted.* In this connection a fact deserves to be recalled which is well known to all mothers, pediatricians, and persons familiar with children. It is not so much the superficial tactile perception to which the child reacts with pleasure and reassurance at an early age as it is the sense of equilibrium, deep muscle sensibility, and joint sensibility. The earliest stimulus to be conditioned is the reaction to change in position (Ripin and Hetzer); loss of support is one of the most powerful stimuli for the provocation of a response in the new-born (Moro, Watson). We believe that during the first three months, when sensory discrimination is *as yet undeveloped, experience is achieved through that part of the nervous* organization which in another publication (60) we have called the coenesthetic system. In the grown-up the sensations of dizziness, vertigo, and seasickness are unpleasant residues of this mode of sensation. It is difficult to imagine how important it is when it constitutes the only instrument of perception, although it is well known to everybody concerned with children that the same infant which can be handled, diapered, picked up, even tossed in the air by its mother with only pleasurable reactions will react with displeasure, often screams, and certainly with a startled expression when *handled by a stranger. This is strikingly illustrated when an infant reacts* to a change of the dry nurse by loss of appetite, weight, and sleep.

All these sectors of the perceptive field are, of course, not discreet in the experience of the infant, they are but different aspects of a total experience. We believe that in the course of its first few months the infant has linked the perceptive experience, "another human being," with all experiences endowed with emotional significance in the course of its life.[11]

This "other human being" is the mother. She was identified in the beginning with relief from suffering and with coenesthetic security. She became further *identified* in the course of *development* with a *visual Gestalt* to which the child reacted with the smiling response. Why then are there children whose reaction to the human face remains negative during the critical period?

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[11] The infant's environmental perception takes place in the beginning through coenesthetic, in the later course of development through auditory and finally through visual stimulation; this last marks the culminating point, becoming the strongest, most effective stimulus for the provocation of the smiling response after the third month. The preponderance of the sense of vision in the course of development corresponds to the ever-increasing importance of diacritic perception in man. Of all senses, vision is the one offering the greatest possibility of diacritic discrimination and has thus become the leading sense of the human race.

The answer is to be found in the background of the children discussed under Variation No. 4. One and all, these children showed an emotional disturbance in their relationship to their mother. Again, it should be stressed that emotional disturbance is a loose term. Not every child suffering from an emotionally disturbed mother-child relationship lacks the smiling response. We do not know enough as yet to circumscribe more exactly the factors necessary for this result. We only know that every child who does not smile in the second trimester of its life has a disturbed emotional relationship with its mother, though not every child with an emotionally disturbed mother-child relationship lacks the smiling response. And we know of one factor which appears to be operative in each of these cases: hostility on the side of the mother towards her child is always present, well repressed behind a surface of syrupy sweetness in our cases. We have been able to demonstrate this factor in some of our films in the movements of the mothers. We believe that these movements, perhaps by producing the sensation of lack of security, transmit the emotional attitude of the mother to the infant, via the sense of vibration and deep sensibility.

We can, therefore, assume that the pattern of the positive response to the smiling stimulus is established by the child's experience with the central figure of its early life, the only other human person, one might say, with whom the child has any contact, namely his mother. This confirms the previously mentioned statements of Gesell, Bühler, etc.: the mother's face is seen in innumerable emotionally charged situations, both during feeding as well as in every other situation of child care, and it is always seen en face.

That it is the close emotional contact with the mother which provides the child with those emotional stimulations to which it reacts by smiling is further proved by observations on the consequences of the separation of infants from their mothers.

Case: Jean. Female, colored. Well adapted, very loving, very good mother.

0;4+18: Test. Satisfactory general development. Good, somewhat advanced social response, smiles readily at the observer.

0;6+0: The whole personality of the child has changed. She looks at the observer with a searching expression, lying almost immobile in her crib. On our approach she lifts her head and looks at us sadly with an element of doubt changing into an expression of profound mental anguish rarely seen in babies. When we tried to approach her, smiling, speaking or fondling her, she cried, not as babies usually do, but silently, sobbing soundlessly with tears streaming down her face. It was impossible to comfort her, even with a very soft voice. The weeping became more and more intense and transformed itself into sobbing while her whole body was shaking. We tried repeatedly on this occasion and on a number of subsequent days to provoke her smiling reaction, but this proved impossible. We inquired from the matron what had happened in the meantime and learned that the child had been separated from its mother.

We have several times witnessed such mourning reactions in children of particularly excellent mothers who have been separated from them. Like Jean, all these children lost weight as a result of loss of appetite.

We must assume that in these cases the loss of the love object has provoked a mourning reaction in the children. However, we have to stress that we have not witnessed this kind of reaction in children under six months of age; it was only present in the seventh month or later.

One might well ask why such a reaction as the smile is not present in animals. After all, animals have social relations, react emotionally to social contacts, distinguish friend from stranger. But they do not smile. I believe that the reason for this is not only lack of facial musculature and its different function in the animal. In our opinion the main reason for this difference is the rôle of the hand in the human being. Sir Charles Bell was, to our knowledge, the first to write of the significance of the upright posture in man, that it frees the hand for grasping. This, in its turn, frees the mouth for the purposes of speech and pathognomy (5, 6). Freud also referred to the upright posture of the human race as a decisive factor in the origin of civilization (29).

We have stressed previously how the nursing child's eyes are not detached from the mother's face for one moment during nursing. This is rendered possible, however, only through the development of the upright posture and the liberation of the hand in man. In the animal nursing takes place at such a distance from the animal's face and in such a position as to make it impossible for the young to see their mothers (Figure 10).

All the other ministrations in the animal are also performed not with the hand, but with the help of the mouth, by licking, holding, handling (Figure 11).

One has only to observe our domestic animals, whether this be cattle or dog or cat with their young to see this. The advent of the hand has emancipated the face sufficiently to enable the infant to behold it constantly. We believe with Freud that this is an important factor in the development of

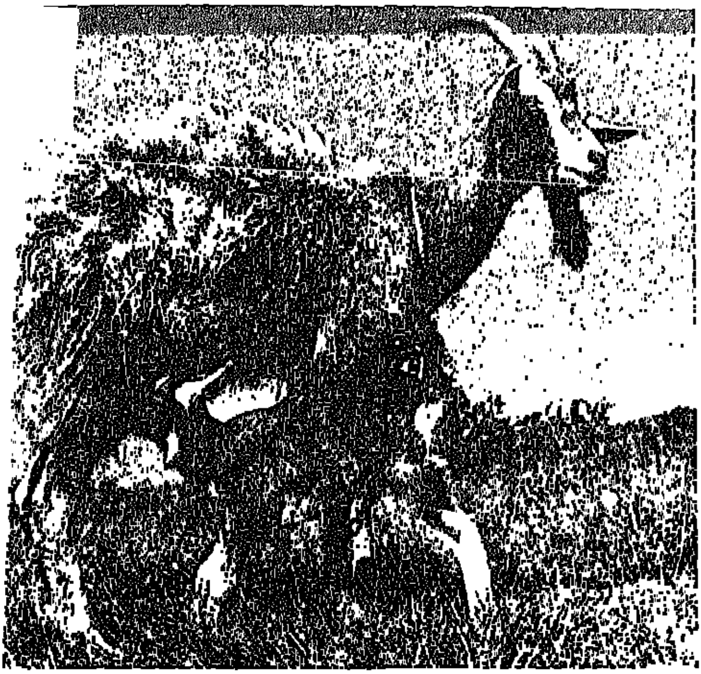

FIGURE 10

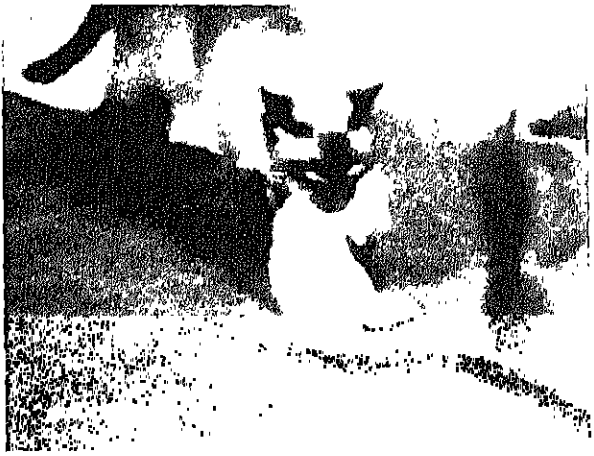

FIGURE 11

civilization. Pathognomic activity in its fine shadings, as distinguished from the excessive poverty of the pathognomy of animals, could only develop when the hand made it possible for the face to take the center of the stage in perceptive experience. We may suspect that pathognomic development was one of the factors which opened the way for the development of language. Some evidence for this is found in the fact that the only animals with highly developed vocal means of communication (though otherwise on a comparatively low level of the animal scale) are the birds. No other animal presents its facial area as frequently and as fully to its young as the bird during feeding.

VII. PLANS FOR FURTHER RESEARCH

Much research is still needed on the problems which have occupied us in this paper. That which we plan to do falls into three categories:

1. The development of our present work along more detailed lines.
2. Thoroughgoing study of the exceptions to the universality of the smiling pattern.
3. Expansion of the investigation of emotional manifestations.

Ad 1.) We have in mind the introduction of measurement of the stimulus and the response, both in regard to intensity and duration, the establishment of minimal and maximal stimuli, the classification of infants in regard to their preference to stimuli. In addition, stimuli which we have not yet tried will be offered. Finally, a differentiaton of the smiling and of the laughing response will be attempted.

Ad 2.) The exceptions to the universality of the smiling pattern which we found were sufficiently fruitful to encourage us in a continued observation of such exceptions, in the hope of finding reliable indicators for the processes underlying them. For this purpose we shall attempt to collect larger numbers of exceptions, with anamnesis and follow-up.

Ad 3.) Smiling is only one of the possible emotional manifestations, the gratification of needs is only one of the possible stimuli for emotional reaction. We shall investigate other emotional manifestations, dependent on other stimuli.

VIII. SUMMARY

1. The infant experiences its relationship with its mother emotionally. The infant responds with a smile to this experience. From the third to the sixth month the signal of this experience is a configurational stimulus originating within the human face.

2. Disturbances in the emotional relations between mother and baby inhibit the development of the smiling response.

3. Normalcy of the smiling response becomes, therefore, one of the criteria of normalcy of the emotional relation of the infant with its mother.

4. The human being establishes its first social relations with its mother. This first relation is the basis of, and determines the pattern for all later social relations. The presence of the smiling response is a criterion of the normal inception of the infant's social relations. Therefore, it may be a prognostic indicator of the infant's later capacity for social contact and social relations.

APPENDICES

Appendix A

It may seem strange that one should have to define the term "psyche" in a psychological publication. Recently, however, this term has fallen into disuse. It has either been replaced by the term "soul," which has a theological connotation, or by the term "mind," which has a materialistic connotation derived from the identification of mind with cortical function during the physicalistic era, which reached its climax in the last century. We define "psyche" as the object of present-day dynamic psychology. It has been described by the originator of dynamic psychology, Freud, from various points of view. It is in the familiar sense of Freud's descriptions that we will use the term "psyche" in our paper.

Appendix B

I note with pleasure that I am not alone in feeling the need to re-define present-day psychology in terms of interrelationships. Gordon W. Allport has devoted his latest article to practically the same subject (1).

Appendix C

The developmental quotients used in this paper were computed on the basis of the Viennese Baby Tests (42).

Appendix D

In this publication I postulated that the human organism consists of two interacting psycho-physical systems: (*a*) the diacritic system, based on an extension of Head's concept of the epicritic system; (*b*) the coenesthetic system, based on an extension of Head's concept of the protopathic system (60).

Appendix E

This may be considered as answering the alternative introduced for purposes of discussion by Murphy, Murphy, and Newcomb (53), namely that the smile might be considered merely a visceral response. We believe that the experiments we are about to describe will isolate a specific emotional stimulus for the smiling response.

Appendix F

Some of the findings of Ch. Bühler have provided a hint in this direction. First of all, it was necessary to achieve contact with the child and to fixate its attention on the experimenter's face. Then she expressly stressed that the smile of the three-months-old is in response to "the eyes" of the grown-up. This implies that the child must behold the grown-up's face "en face" or full face, to use the photographer's term. And she had also stated that the grown-up has to smile.

APPENDIX G

The term, "Homeostasis," originally introduced by W. B. Cannon (17) to describe a physiological state of interaction resulting in the maintenance of equilibrium in the whole organism, has in the meanwhile been expanded both by its author (18) and by academic psychologists. It is now also widely applied to describe psychologic interaction taking place in the process of maintaining psychological equilibrium. This amounts to a more or less tacit incorporation of the concept of a psychic regulation principle, originally introduced by G. Th. Fechner (27) under the name of *Stabilitätsprinzip,* and then elaborated by S. Freud under the name of "pain-pleasure principle" into a conception impressive both in its magnitude and its consequences. In the conception of Freud the pain-pleasure principle embraces both the somatic and the psychic aspects of the organism and serves as a regulator for the maintenance of optimal equilibrium, with the help of psychically controlled discharge processes in the somatic sphere. In his later work Freud elaborated the model of the pain-pleasure principle in two directions:

(*a*). In the direction of biological thinking (in contrast to physiology): He applied the "Nirvana principle" which Barbara Low had suggested to the problem of regulative processes in phylogenesis, while retaining the pain-pleasure principle as the regulator within ontogenesis.

(*b*). In the other direction, he extended the pain-pleasure principle to the problems of adjustment to the total environment, social and otherwise, by introducing that modification of the pain-pleasure principle which he called the reality principle.

In all three cases the model[12] is that of a regulation principle which serves to maintain a given state of equilibrium and to reëstablish it when disturbed. Interpreted from the standpoint of the pain-pleasure principle this regulation takes place on a psychophysiological level. In the case of the Nirvana principle it is the equilibrium between death instincts and eros instincts which is regulated. And in the case of the reality principle the equilibrium between the individual's needs and the environmental opportunities is regulated. In all three cases the term equilibrium becomes more than a purely verbal analogy if we accept the basis on which Freud applied it, the basis of his theory of instincts (30, 31).

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[12] The concept of the model as an *instrument of thinking and description* was introduced into science by Niels Bohr in connection with the atom. It was first applied to psychology by Karl Buhler.

Most academic and physiologic psychologists, however, do not include the biological implications of Freud's concept in their approach. They try to keep it on an Ego level when applying it to the social sphere, thus losing much of the meaning and the value of the concept.

APPENDIX H

E. Kris (in "Laughter as an expressive process," *Int. J. Psychoanal.*, 1940) expresses the following hypothesis:

> The smile retains the privileged place of the first-born in pathognomic functioning. One can say that it appears everywhere as a substitute expression, to bring about a moderation of any pathognomic situation which was of a contorting kind: . . . We could put forward some such view as the following: that in all these cases the smile expresses a "relief from tension," a discharge of very small amounts by the ego (p. 327).
>
> For we may connect the capacity to organize and shape the pathognomic-motor process with the most archaic function of the ego, with its task as an apparatus for inhibition. We touch on previously developed lines of thought when we suggest that it is the function of this apparatus to subdue the primordial rhythmical movements and to mould them into the temporal forms of pathognomic activity (p. 338).

We ourselves would prefer to say that smiling is the first of the structured (and also mastered) of those pathognomic-motor manifestations which characterize the discharge of emotional tension. For this reason smiling becomes also the first mastery of pathognomic manifestations which is appropriate for the purpose of social reciprocity. On the other hand it is also the first mastery in the field of pathognomic expression which is used indiscriminately in the beginning of the infant's ego development for the expression of all positive emotions.

APPENDIX I

In view of the overwhelming number of positive responses it might be argued that at least some of the negative reactions might be due to abnormalities of the infant's vision. According to the opinion of leading ophthalmologists, however, no affection of the infant's eye short of complete lack of retina or congenital cataract (making digit counting impossible) could be of such a nature as to disturb or distort in any relevant or significant way the close range perception of the stimuli offered in our experiments. This statement is confirmed by the fact that the catamnesis of the deviant cases of this study does not show any complaints of visual disturbances.

APPENDIX J

The phylogenetic patterns investigated by McGraw all belong into the sector of body mastery. The sector of perception per definition functions on the same lines, since it is closely bound to neural development. Our observations have shown that in premature children these two sectors of the personality are retarded during the first three months of life or so, in proportion to the number of months which the child was born before term. On the other hand, we have observed in children born after term a proportionate advance in these sectors.

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FINGER-PAINTING AND PERSONALITY DIAGNOSIS 129
By Peter J. Napoli

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FINGER-PAINTING AND PERSONALITY DIAGNOSIS*

School of Education, New York University

PETER J. NAPOLI

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I. THE PROBLEM

A. STATEMENT AND DISCUSSION OF THE PROBLEM

The purpose of this investigation is to define, describe, and present Finger-Painting as a projective technique in the diagnosis of personality.

Finger-Painting was started by Ruth Faison Shaw in March, 1930, in her school for American and British English-speaking children in Rome, Italy. Since that time the material has been standardized and the method of administration has undergone many revisions. As the process became known in Europe and the United States, its name spread. Currently Finger-Painting is being used for decorative purposes, e.g., on book jackets, box cover designs, wall paper, etc. Teachers using progressive methods employ it as an educational medium for the development of skills and articulation as a means of dealing with the child's reactions to experience. Further it is being used by some as a technique in pure art.

In 1934 interest was shown by Adolph Meyer of Johns Hopkins University and C. Macfee Campbell of Harvard in Finger-Painting as a therapeutic instrument. During the summer of 1935 Finger-Painting was introduced in camps and clubs as a definite arts and crafts project. At the present time this medium is part of the recreation program of Red Cross Units, the U.S.O. centers, and other service centers and hospitals of the Armed Forces.

Finger-Painting has a definite method of administration. The paints themselves have been standardized so that they do not turn rancid under normal conditions; they retain their characteristics of color and consistency and do not cause irritation or infection when in contact with the skin or with open wounds. They have moreover been rendered harmless to children in that they do not contain any substance harmful to the gastro-intestinal tract if inadvertently swallowed. The paints may easily be washed out of clothes with clear water; they leave no stain on wearing apparel.

Although Finger-Painting has been used as a decorative, recreational, educational, and therapeutic instrument, literature is decidingly lacking on its diagnostic use as a tool in personality studies.

B. BACKGROUND OF AND NEED FOR THE STUDY

In 1940, while watching a demonstration of finger-painting used as a recreational device in a guidance laboratory, the writer became interested in the medium from a point of view which he had not previously considered. He felt that the individuals while painting were at the same time leaving some "clues" concerning their personal feelings and behavior traits. Acquaintance and interviews which later followed with Ruth Shaw, suggested the possibility that finger-painting could be useful in the study of personality. A comparison of the clues in many of the paintings from Shaw's private files with what was known of the individual's personality motivated the writer to experiment with finger-painting in personality diagnosis.

The writer's background in clinical psychology and his familiarity with other projective techniques makes him feel that Finger-Painting has great potentialities as a clinical instrument in determining certain etiological and causative factors in personality and behavior.

Goodwin Watson states: "We believe that those studies should be encouraged which consider the whole personality, in its immediate situation and as part of larger culture patterns which extend over a long enough time to show sequences in the development of personality, and which include acceptable as well as the problem patterns of living."

That the results obtained through the use of questionnaires, inventories and schedules are unsatisfactory is also indicated by Watson when he further states: "There have been hundreds of reports of questionnaires, rating scales and correlations which were hastily conceived, uncritically applied, and which contribute nothing worth consideration."

Because these objective devices in many instances do not supply dependable information a different treatment in the study of the complete personality is indicated.

Further, the wide interest shown in projective techniques justifies the investigation of Finger-Painting at this time.

Lastly, Finger-Painting, although widely used, has, as yet, not adequately been defined, described, and presented, and this also justifies this project.

C. Definition of Terms

Finger-Painting—"A process with which communication can be established on either a verbal or non-verbal level."[1]

Personality—of an individual as used in this study will mean the sum total of one's experiences and his persistent tendencies to make certain kinds of adjustments as a result of these experiences at a given time.

Diagnosis—will mean in this study "a condensed statement of the practitioner's conception of the remote and immediate causes of the condition. Diagnosis is not labelling of the individual or his problem. The terms applied to the varieties of adjustive behavior are freely used as concepts, but do not constitute diagnosis in themselves. The value of such designations as "compensations," "negativism," "compulsion," or "hysteria" is that they serve in the place of long descriptions of these forms of responses."

---

[1] As defined by Ruth Shaw

Projective Technique—"A projective method for study involves the presentation of a stimulus-situation designed or chosen because it will mean to the subject, not what the experimenter has arbitrarily decided it should mean (as in most psychological experiments using standardized stimuli in order to be 'objective'), but rather whatever it must mean to the personality who gives it, or imposes upon it, his private, idiosyncratic meaning and organization." Shaw's Finger-Painting process is among the many devices that Frank mentions as projective techniques.

To the above definitions will be added a technical vocabulary specifically coined to describe the language of Finger-Painting. A list of these words is found in the appendix in the form of a word-page reference glossary.

D. DELIMITATIONS

1. The method of administration will be the same as that used by Ruth Shaw.
2. Shaw's Finger-Paint only will be used.
3. The intelligence quotient will not be considered as a factor in this study.
4. The study will concern itself with the emotional level, state, or condition of the individual at a given time, which time may be an index to his general behavior pattern. Whether this index is transient or part of the subject's personality structure may be decided by additional paintings.
5. The evidences which have been collected for illustrative purposes have been gathered from mental hygiene clinics, psychiatric institutions, schools, hospitals, and service centers of the Armed Forces.
6. The materials from the personal files, notes, and writings of Ruth Shaw and of the investigator constitute primary source material. Discussions with personnel in charge of the cases and the literature in the general field make up the writer's secondary source information.

E. PLAN OF THE DOCUMENT

The presentation in general is divided into eight chapters and the appendix. Chapter I has already considered the problem in several of its aspects. Chapter II presents the highlights of Ruth Shaw's life, her educational philosophy, and the development of Finger-Painting from its origin in Italy to its present day salient features. In Chapter III the kit and supplementary material is described from the viewpoint of content, color, odor, consistency, harmlessness, washability, and standardization. In Chapter IV *the preparation and arrangement of the material is considered; and the* actual administration of the technique is completely presented. In Chapter V the Finger-Painting process is explained. The significant categories pertinent to the process are developed. They include handedness, color, motion, rhythm, texture, balance, order, symbolism, and verbalization. In Chapter VI the individual's performance is described in terms of his physical behavior and reactions during the Finger-Painting performance. Some aspects of interpretation are presented with case illustrations in Chapter VII. Emphasis in this chapter is given to the schizophrenic and paranoid personalities. Chapter VIII summarizes the document, presents the conclusions gathered from the context, and suggest needed research. A bibliography and a glossary of technical terms in a word-page reference complete the document.

II. HISTORICAL BACKGROUND

The story of Finger-Painting is the story of Ruth Faison Shaw. The events, the people, the places, the thoughts, and emotions that effected the formation of her personality, are inextricably intertwined with the discovery and perfecting of Finger-Painting. Her story is a romantic one, covering as it does the fabulous places of America, Europe, and the Near East; the mountains of North Carolina rich in the lore of backwoodsmen and mountaineer; Rome, the seat of ancient learning and beauty; Constantinople, the hybrid city, with its odd mixture of East and West. The people that have been intimately connected with her and who therefore shadowed and conditioned her ideas and teachings were of all types and stations: the Elizabethan Americans of the Southern mountains, the poor and lowly of American cities, the noble and rich of Italy's ruling classes, the conglomerate troops of America's World War I Army, the ragged fakirs and the fezzed merchants of the East.

It is evident then, that the history of Finger-Painting cannot be effectually related without first considering the personality and theories of its reviver, Ruth Faison Shaw.[2] Ruth Faison Shaw is an artist, though she would be the last to claim the title. Her art is teaching. Her doctrine of creative education, self-taught and demonstrated in her own experimental school in Rome, reveals more than a touch of genius. Here is a vibrant personality, with an unfailing appeal to children of royalty or of slums. She has taught both, testing her philosophy of basic education on primitive, pampered, or underprivileged children with uniformly amazing success.

Ruth Shaw grew up in a Southern parish in Eastern North Carolina of which her father was the Presbyterian minister. There were five children, all boys save Ruth, and for lack of other companions they had to find their resources within the family group. The children gave their own pin-shows, invented their own games, staged dramas and rites partly influenced by Gayley's Classic myths, but more often palpably tinged with the tar brush of their negro mammy's superstitions. Without such healthy, simple, childhoo experiences, perhaps Ruth Shaw would never have made such a success o understanding small children "inside out" as she does.

In her teens, she undertook to teach the mountaineers' children, some o them older than herself, in the Sky lands of her native state. There, as a inexperienced schoolma'am, she at one time nearly met her Waterloo i trying to make the ocean real to children who could not imagine a body of water wider than one of their own mountain streams. There among the remnants of America's Elizabethians turned "moonshiners," she had her initiation into the art of teaching by touch-stone, working out from one's own environment, whether that environment is a dreary coal-mining village or a humdrum Sauk Centre.

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[2] Some data in this chapter are taken from mimeographed material distributed l Binney & Smith Company.

The father of one large family up in that Sapphire Country in the mountains had a remarkable collection of gems, some taken in trade, others plundered, Ruth Shaw suspected, from nearby Indian burial mounds. There were precious stones pierced with holes for the adornment of Indian chiefs—gems worth a fortune—opals from Peru, corundum sapphires, rubies, garnets, moonstones from Alaska. Yet, the daughters of the house wore linsey-woolsey. Nothing in their experience had prepared them to understand the richness of velvets and satins as attributes of royalty. However, when their inspired teacher made use of these treasures to teach these mountain-bound children, they could visualize the power and glory of the world and its great ones. She could take them to Peru or Alaska though they had never in their lives left their native haunts.

Her growing absorption in work with the mountain children, was interrupted by America's entry into World War I. She joined the volunteer group of the Y. M. C. A. and served in Canteens overseas for several years, first in France and, after the Armistice, in Constantinople. In lieu of children to teach, she now took into her care parties of young sailors on leave in that city of Oriental splendor. History became alive for those lads when Ruth Shaw conducted them on informal sight-seeing tours far from the beaten track. Teaching "on location" has since become a hobby with her . . .another application of the touch-stone principle. In Constantinople, in the bazaar, sat a cross-legged Hojah who christened her in all respect "the woman whom men follow." He little realized how prophetic his words were to become. She remained here for almost two years. What detained Ruth Shaw in the city on the Bosphorous for that time, was an absorbing interest in the traditional patterns and colors of Oriental rugmaking, a background which later was to give her the courage to pursue her researches into the history of ancient art in many lands in the quest for pure colors and a safe base for Finger-Paints.

She was now on the eve of her second venture in education. Joining a party of friends in Italy in September of 1922 she was persuaded, with the backing of Richard Washburn Child, the American Ambassador; Frank P. Fairbanks, member of the American Academy in Rome, and other prominent people in the English-speaking colony there, to open a school for British and American children. This she did, in a charming old Roman villa called Villa Lante sul Gianicolo which had been built in 1627 by Guilo Romano, and in which ancient history could be studied in terms of the archeological fragments dug up by the children themselves in the centuries-old gardens. This villa is the only one within the Gardino Gianicolo where the setting sun looked down not only on the glories of the past, but on those of the very immediate present—a group of American children. The schoolroom was in a famous enclosed loggia overlooking a panorama which was a constant inspiration to beauty. This scene the children shared with Garibaldi's monument, a man whom they accepted as a hero. They saw through his eyes a new and progressive Italy.

The minds of these children were stimulated by the constant remains of scavi which they dug from the Villa Lante Gardens. They came from the piles of Votive offerings thrown from the Temple of Janus, when the suppliants were healed. Miss Shaw frequently transplanted her history class to the Forum or the Coliseum for picnics and sight-seeing walks over the very grounds trod by Roman senators and gladiators. She told them tales of gods and goddesses and of the deathless mortals who once dwelt within the city walls. She joined them in playing games of their own invention with imaginary swords and chariots. On returning from such outings, she encouraged the youngest members of the class to recount their reactions to the places they had visited and had peopled with a lively fancy. Seizing her pencil, she would take dictation from five-and-six-year-olds capable of composing orally striking, coherent, stories far beyond their own untrained manual ability to write. Privately published in Rome, and later brought out in a limited edition as *The Old Shoe* (49) and *The Second Old Shoe* (50), some of these now famous children's stories reappeared 10 years later in an American periodical (52). Most readers were delighted. Some were incredulous, suspecting a literary hoax. Those familiar with Ruth Shaw's unorthodox and stimulating methods know better. Those stories, just as she took them down, were the bona fide products not of prodigies, but of average children handled with masterly technique. Other progressive teachers, who had independently made the same discovery elsewhere, were beginning to introduce this dictation method.

Although not a school for problem children, yet in a group from such a cosmopolitan society there were sufficient behavior problems to challenge the teacher. In such a social group in that generation do not these children present some of the varied complexities of our modern age and culture?

As the school increased in membership (it had now moved into the city of Rome) the problem of communication became more and more difficult due to the diverse language origins of the children's parents. The cultures and nationalisms of localities, present in international intrigues, were reflected in the children, as illustrated when a British child said with contempt, "Who is an American?" and answers, "Why America was settled by immigrants." To which an American child retorted with a shrug of his shoulders, "But Tommy comes from England—one of the tiny pink islands off the coast of France." Language here was a barrier for the children's friendly communication, for French and Italian speaking children looked on understanding only tones of derision in this, to them, non-understandable language—English. Because the children as a group represented many countries, languages, and levels of adult environment, there arose an immediate need to solve the problem of intercommunication among the different language speaking groups. Ruth Shaw spoke English. The music teacher spoke French. The latter's group naturally used French sounds when speaking to Ruth Shaw. The crafts and playground instructress spoke Italian as did her class groups because it was their native tongue.

The attitudes, actions, and tone of voice of the children were understandable to onlookers though the language was not. Miss Shaw soon noted that the children seemed to be able to communicate by means of movements plus sounds and tones. When this group of multi-language speaking children played pleasurable games instead of sarcastically dramatizing their divers-origins, there was no need for the teachers to explain the "rules of the game" especially if there were movements accompanied by sound. It was soon recognized that these children succeeded in communicating with each other if they did it through dramatized movement accompanied by words in their native language. Although speaking different languages, the children were able to understand each other without difficulty. However, when Miss Shaw's mother spoke to the children, comprehension was difficult because of her American southern drawl. The difficulty was due to the fact that adults spoke on their particular level and cultural pattern, and the children used their particular background. However, they never misunderstood each other (adults and children) if the words used were accompanied by some gesture, motion, or action. As such was the case, then sound became wedded to movement. Sound became one of association of identification with an experience, i.e., the French child would easily understand "veni ici—come here" when accompanied with gesticulation of the hand. We then have (*a*) gesture (directional motion) and (*b*) voice (with intonation). Intonation is a word in motion from the throat. Thus, with habit formation of the same experience, children would learn words with much more facility, permanency, and understanding. This method of associating sound and motion became the common denominator for communication among the teachers and the children at the Shaw School in Villa Lante.

Ruth Shaw's explanation of the above theory follows: When rapport is so established with the child that he is understood—it is not only that you are teaching the child, but also, that the child is teaching you what and how we learn (from observation and communication). That is why children can get so much from other children. Therefore, teaching, being a reciprocal process, should not be considered effective teaching until there is a natural "*give and take*" *between the teacher and* the child. *Children understand* each other better because they can see movement in each other that the adult seems only as a *static individual*, i.e., a *mother can understand the wants* and needs of the crying infant, yet, the infant isn't talking nor is the mother hearing words. Therefore, motion *with sound is very significant* and important in understanding the child.

Dramatization among children is an early art form. The idea grew that the utilization of other forms, plus sound or language, could be used on more advanced levels of development. More complex games were easily taught following a more simple form. Creative music as well as original storytelling with pantomine were employed. These songs and stories were automatically recorded and became teaching material for this group. The recordings were possible through the use of secretary and dictaphone. These stories (49, 50) became some of the matter in the school, and were especially effective when taught to the children by the young author who might not be able to read. The arts of childhood were incorporated in the school's curriculum except that of representation through painting. How to give the child a material which he could use as effectively as he was doing in the other arts, was answered by the young Italian Prince who smeared iodine on *the bathroom wall and cried out an historical remark*, "I *don't* care what you do to punish me because I had fun smearing. I've always wanted to smear—sempre! sempre!"

Following this incident, five little children came to the teacher with Mary as the spokesman for the group and said (in Italian), "We have something to say to you, but we are ashamed to say it in English, but we will tell you in Italian. You like Leonardo (the smearer) better than you do us." The surprised teacher asked, "Why do you think I do?" With assurance, Mary answered, "Because you let him smear and you have never let us smear."

During the interim of amazement on the part of the teacher, one of the five gasped in English, "And you forgot to punish him." Here was a challenge to the teacher from the children—an example of millions of episodes in the teacher-child, child-teacher relationship.

Then followed the search on the part of the teacher for the material with which children could "smear" as they had requested. It was obviously impossible to use iodine as had the little Prince. The material that the child could smear had to meet every demand of the parent as well as those of the teacher. It had to be harmless in every respect and also pleasurable.

The old painter who came to paint the bathroom wall, brought color in small twists of newspaper with which to tint the paint to cover the iodine-smeared walls. He was the first to give hint that these colors were earth pigments which the old masters had used and would hurt no one. Obviously, the lead and turpentine he used could not be used as a binder for these ground colors. It was soon discovered that egg or sour milk were acceptable for this particular use. Upon advice of a color chemist, starch and other like substances were discarded as some children's hands and skins were allergic to these commodities. Through a young priest who was doing research in the Vatican Library, various recipes of "Skin ointments" and "beauty lotions" were obtained. One, which tradition says was a favorite of Cleopatra's, was found to answer all the requirements of parents, teachers, and children. This lotion was soluble in water, non-toxic, not only harmless, but helpful to the skin, and pleasant to the touch.

By the Spring of 1929, a new difficulty arose. Although the pigment and the binder were correct, the substance was not satisfactory. Although the mixture had to be cooked and the color added it would not coagulate. "Carlos the cook" solved the problem by cooking the material for a longer period of time, continually stirring it over a slow, but hot charcoal fire in a copper "Bagna Maria" until complete coagulation took place. At last the concoction was used by the children, and immediately called *finger-paint* by "Jack of New Jersey," a boy of 10, who explained, "We call it finger-paint because you don't have to use brushes." To this day it is called Finger-Paint—a misnomer perhaps to the adult—but understandable to the child who understands a child's language.

The children accepted Finger-Paint as such a natural phenomenon within their own experiences, that they saw Finger-Painting everywhere. Wherever there was movement that left a record, they saw Nature's finger-painting—on the beach of Anzio, as the rolling waves pushed the sands on the shore, and as the cumulus clouds boiled over in the blue skies of Italy; as they stood on the school terrace overlooking Rome and the Campagna; as they watched the fountains play at Tivoli; as they watched two old peasant women in russet and green costumes scrub the marble floors of the Papal Palace at Castel Gondolfo in a finger-painting of "saponi e pietro de marrmo"; after the rains as water gushed down the footsteps and washed the paths of ancients in the Roman Forum. As these children saw these natural creations they likewise created in Miss Shaw's new material, movements which were their "stories"—not pictures. This, to the teacher's great joy, was a new means of communication from the depth of the child's experiences and his reactions to those experiences, his imaginations, his phantasies, his desires, and ambitions. His story or picture became a record of that child at that given time. The performance was a communication which usually was beyond the comprehension of the teacher so that the child, in his zeal to put across his meaning, verbalized a story about his performance.

Although the verbalization may have been a conscious effort to further his communication, the performance proper had more subtle meanings in terms of his individuality. For example, a child of seven made small, tight rings all over the paper and with violent rolling motions rubbed them out for two weeks duration. Finally, he explained with a sigh, "You don't seem to understand—all these are little-big people, and I drown every one of them—none of them ever escaped!" Thus the child aided the teacher in understanding him better as he became more articulate and more skillful by repeated performances. The teacher in turn, through greater understanding, could meet the child's needs more intelligently. Finger-Painting, in this form, was being used in the Shaw School as an educational device, permitting the child to teach the teacher about himself, also permitting the child to learn "to give out" through free expression with a material he could use without a sense of defeat.

Finger-Painting afforded a medium sufficiently primitive and pliable to be used by anyone at any particular stage of development. Its primitive elements are water, a mud-substitute, and color, which give the child a means of communication for which he has no words. "Finger-Paints are direct descendants of mud-pies. All I have done is to add the rainbow" (53). Perhaps clay might be considered as a transition from the mud-pie era to more skilled representations. This would be followed by brushes with tempera or show card colors. Big chalks also come along before the art of drawing is taught. Drawing is a highly intellectual concept, outlining the extent of mass in space while finger-painting is moving the mass in space. Ruth Shaw makes the statement: "A child should be free to learn from his own experience and express what he knows in play, and by the use of simple materials which he can handle without any conscious effort" (53). This implies, as stated before, that education and teaching is a reciprocal process wherein the child and teacher become mutual symbionts in the learning process. At the same time, the teacher, having insight into the child's behavior, can interpret this to the parents and integrate the trinity of child, teacher, and parent. This trinity cannot be over-emphasized during the developmental stage vital to the child's preparation for wholesome living.

Some of the children in Ruth Shaw's school, because of their distressing problems, were under the care of personal physicians. The parents reported to the teachers that these doctors were commenting on the unexpected *improvement in their children*. *The teachers were unable to give a proper* explanation until a hint came when an enuretic boy of six, while pouring a little water on his finger-painting said:

> "*I have so much water here today I don't have to do it at night.*" As he picked up his painting and the water dripped on the floor, he added, "You naughty paper, you wet on the floor, but I don't wet any more like I used to when I was a little boy."[3]

Upon inquiry it was found that his enuretic condition had ceased several weeks before. At the same time, it was noticed that his reading processes had improved greatly. That he socialized better with other children was probably attributable to the removal of his guilt feelings. Was it Finger-Painting that caused this change? Similar instances involving stammering, *parental rejection, insecurity, emotional and social retardation, night terrors* and avid masturbation, all showed improvement with the introduction of Finger-Painting into the class. The referral of still other cases to the school by physicians, strongly pointed to this medium and technique as the influencing factor. The reason, it is apparent, was that a disturbed child is not keyed to learning. In the educational process it is necessary to remove the obstructional emotions in order that the energies of the learner may be utilized in learning, which itself should be a joyful experience for the human being.

Educators could not fail to contrast the artistic achievement by very young children in improvisation in color and rhythm using finger-paints, with the usual crudity of a child's first efforts with crayon or brush. Demonstrations were demanded and drew crowds. Incredulity was convinced when one saw Miss Shaw take strange children from among the spectators, introduce them to low tables with large sheets of damp paper and an assortment of small cans of colored finger-paints, and turn them loose to follow fancy's bidding.

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[3] From the personal files of Ruth F. Shaw.

Brushes were noticeably absent. The children were encouraged to plunge in and spread the blobs of color with the spread palm, clenched fist, fingers, above all, to use free rhythmic muscular movement of the whole body. Before the eyes of enthusiastic and skeptic onlookers, the imagination of the absorbed children seemed to flow into visible form with effortless facility. Strange, exotic flowers bloomed under their hands—flora and fauna from fantastic deserts and forests and gardens under the sea. Spindrift floated on storm-tossed waves. None of this had to be shown them. Balance, composition, perspective seemed to teach themselves.

"Finger-Painting gives color and form to thoughts for which children often know no words," they heard Ruth Shaw say.

What she had succeeded in doing for art in education was to free childhood expression from the bonds for grown-up tools requiring conscious effort and long practice to master. Picture making with Finger-Paints and bare hands was as simple a game as making mud-pies.

It is this free unhampered revelation of a child's inner fantasies through his muscles which so intrigues psychologists, and as such, has opened up almost inexhaustible potentialities for future experimentation. It is not always a thing of beauty that emerges at the peak of a child's creative effort. The same energy may go into the supreme effort of expressing something sinister and evil which is the "outward visible" sign to a trained observer of inward emotional disorder. It may be merely a symptom of some recent minor upsetting experience, speedily eliminated and soon forgotten. Or, it may afford a clue to some deep-seated obsession in the child's subconscious which is interfering with his normal progress; and, in coming to the surface repeatedly, as in a series of Finger-Paintings, may release its victim through a process of mental catharsis.

Finger-Painting is one of the media for drawing out of the child what is hidden within him . . . his own life experiences. He must be led by the teacher to make his own discoveries and to think things out for himself. The more limited a child's environment and opportunities, the more resourceful and ingenious must his teacher be. A really resourceful teacher, Miss Shaw believes, could find means to educate a child for college in the midst of the Sahara Desert. She has often thought she would like to try it.

In a center such as Rome many visitors came to the school. Among these were famous artists who showed surprise and admiration for the paintings of the untrained young. How were these children taught composition, balance, rhythm, abstract representation, color, harmony, etc., queried men who had studied long and laboriously. These guests were astonished when it was explained that no training had been given or art appreciation had been taught. This was an expression by children who had been taught law and order of procedure in a condition of freedom from adult interferences—muscular freedom through good posture, freedom to paint as they would, freedom from criticism of their "stories" even though their "stories" might be of lying, stealing, or killing. Laws that underlie art representations seemed to function within this free agent, the child, and were manifested through rhythm, repetition, composition, balance, contrast, and content. It is singularly noteworthy that the young child expressed himself through abstract symbols and movement more often than through representation by form. The teacher's rôle of appreciation of the child's skill at his level of development brought such satisfaction within the child that it followed that he was buoyed up by this recognition. He and others would often discuss the "picture" intelligently. In the educational process the discussions of opinions aid in the proper development of language skills and reasoning. These discussions often brought forth powers of discrimination—the ability to make choices conducive to the proper standards of cultural development. In such a discussion one eight-year-old child remarked, "This picture is good for a cover for a book about birds." Another child said, "This is good to be framed for my mother's room." From still another eight-year-old boy: "This is a good one to throw away because I don't need it any longer." This last boy's remark of "I don't need it any longer" illustrates a great educational truism. If education as a process means constant growth, then the individual must constantly eliminate that which is no longer contributory to his growth and development. This may include disturbances of an emotional, social, educational, intellectual, or physical nature.

The recognition of the children's abilities in creative work, particularly in finger-painting, brought Ruth Shaw invitations to incorporate her ideas into other schools. Accordingly, in January, 1932, she accepted the invitation of the MacJannutt School in Paris, France, where she taught until June of the same year. This was so successful, that further invitations were extended her to give a series of lectures at the Sorbonne University.

It was here at this famous institution that the first public demonstration of Finger-Painting was given. It was during one of the lectures at the Sorbonne that a noted French woman interrupted with the skeptical observation that if children had actually done these things (which she found hard to believe) they must have been French or Italian children: "The children of Americans have no creative talent."

In Paris one exhibition followed another. A Chinese philosopher, who attended one, assured Miss Shaw that she had rediscovered the lost art of China, ancestor of Japanese color prints. At another demonstration, an eminent psychologist watched with unfeigned astonishment the unconscious unfolding of their life's experience by two young Russian boys who had never seen finger-paints before the demonstration. One had been brought up in the bosom of his family, in the lap of luxury; the other boy, his cousin, had been tortured by revolutionists and left as a waif to shift for himself, had slept in gutters, hunted and hungry, until fate restored him, at the age of 11, to his uncle's household. Outwardly, the two were dressed alike, had the same impeccable manners, aristocratic bearing. A quarter of an hour's Finger-Painting revealed to the trained observer the different courses of their lives.

Raymond Duncan brought his ragamuffin gamins from Paris's streets to Ruth Shaw's Studio. Diego Rivera asked her to come to Mexico and work among the primitives "where she belonged," instead of wasting her time and gifts on the children of the wealthy. But she challenged him! Who are the real poor? Often they are the very ones who have everything done for them by servants, every want anticipated, no chance to try things out for themselves, and learn by experience. These were the children, she noticed, who reached for the earthy colors, black and brown, when first introduced to Finger-Painting; whereas, Raymond Duncan's homeless urchins, who slept under the Seine bridges, satisfied their longing for beauty and the color lacking in their daily life by joyous smears of bright reds and yellows. An exhibition of the children's pictures was also held at the Jeunne Paintures Galleries as well as at the MacJannutt Schools to which notable painters and educators came. Paris newspapers gave wide publicity to this new medium.

Early in 1932, Ruth Shaw discovered that, though she had arrived at the idea and process of Finger-Painting through independent experiments, she was not truly the originator of this art medium. It was in the spring of that year, while strolling the left bank of the Seine, and browsing among the famous old book-stalls lining the streets, that Ruth Shaw discovered in a rare old book on Roman and Greek Art, that a process much like hers was discussed. Later, she discovered, among the remnant notes of Pliny the Elder, a story in which he described a paint applied with hands and sponges to the walls of Roman houses, particularly in Pompeii. It was evident then that finger-painting had been used before, but not under this name or formula. The formula of the paint Pliny was writing about was evidently among his last notes. If it had appeared during his time, the supposition is, it must have been used in other ages also. Another story was found which concerned itself with a Frate who had used a kind of finger-painting with wayward boys in Munich in the fourteenth century. This tale was confirmed during the summer of 1933 by a female member of a family in Basle, Switzerland, who came to Rome to investigate the use of Finger-Painting. She thought there had been a leakage of a secret paint formula known only to six families since the Munich days. She spoke to the family in Basle who had a "secret recipe" for making the paint with which these families had supplied the demand for book-lining papers ever since their migration from Munich. She was convinced that the formulae were different in composition and purpose. Her "secret paint" contained acids which were detrimental to the skin and was used only with carefully protected hands. These people made their intricate patterns by use of combs, brushes and other instruments. Finger-Painting on the other hand was used at this time as an educational device for children and used with the bare hands.

A conversation with a French archeologist, at this time, brought forth the supposition that the paintings in the caves of southern France were made by scratching their outlines with some sharp instrument and painting in the body with a paint similar to Finger-Paint, and applied with the hands or with fur. While these wall pictures were never examined to confirm these findings, fragments of painting were found in ruins of old Roman villas in the Campagna which bore the imprint of human skin.

For a more ancient use of Finger-Paint a trip was made to the Eutrascan underground Tombs at Tarquinia and Cittiavecchia near Rome. Aeneas was supposed to have landed here, on his escape from Troy. Paintings and fragments found in these crypts also bore evidence of paint applied by fingers. In the spring of 1933 a Chinese philosopher related the story of finger-painting or a similar method used in China in the seventeenth century. This however, might be distinguished as finger-tip painting done with a certain kind of ink.

With dates in the twentieth, seventeenth, fourteenth centuries and more ancient times, was it coincidental that finger-painting or a similar method reappeared about every 300 years? This was suggested by Raymond Wheeler in his study of cycles of the human race.

Finger-painting as it appeared again and again represented the recreation of art periods. The twentieth century was the first time any record was made of its use as an educational device for children, and its present application to recreation, therapy, and diagnosis.

The ancient books, fragments, geological remains, etc., depicting the early history of finger-painting are stored in Rome at the present time.

An invitation next came to exhibit at the New School International Conference at Nice in July, 1932. At Nice, educators came from many foreign countries and marvelled at the dexterity of children who painted for the first time with Finger-Paint. Among the many further invitations extended to demonstrate Finger-Paint, the one to the Dalton School in New York City was accepted by Ruth Shaw in the fall of 1932. The stage was set in New York for more suitable conditions than had prevailed in Europe. A well-equipped studio was set up where 90 children were accommodated each week. With these improved facilities it was possible to keep adequate records of the findings, many of which confirmed Miss Shaw's previous observations. The complete record of these 90 children for a period of an entire school year were on file at the Dalton School until they were accidently destroyed by a janitor. Fortunately it was possible to salvage 18 of these records, which have aided in later studies.

Because of the interest of educators, accelerated by much publicity, this studio became a center for sight-seers, novelty seekers, and businessmen, as well as a place for conferences. In June, 1933, another invitation was accepted through C. K. Ogden of the Orthological Society in England, which resulted in Finger-Painting being introduced into the various schools and clinics of London and Cambridge. It was then that Finger-Painting was mentioned *for the first time over the radio through the courtesy of the* British Broadcasting Company. The broadcast related the story of Finger-Painting in Basic English.

Until this time Finger-Paint material had been prepared privately. Now, as the demand for it grew beyond the capacity to supply it, it was necessary to organize a more adequate staff. This organization was made after Miss Shaw's return to New York. The new plant was situated in a loft on East 48th Street near the East River. This organization, known as the Shaw Finger-Paint Studio, Incorporated, copyrighted the word "Finger-Paint," and patented the formula in 1933. For the first time Finger-Paint was sold directly to teachers who had been requesting it. It was then introduced and sold commercially at Saks Fifth Avenue during the late summer of 1933. Miss Shaw's plant manufactured the medium exclusively until August, 1934, when the demand for Finger-Paint was so great that the formula was leased to the Binney & Smith Company which today still remains the manufacturer and distributor of the product.

It was during this time, October 1934, that Ruth Shaw wrote her book on *Finger-Painting,* published by the *Atlantic Monthly* through Little, Brown and Company. Binney & Smith, in meeting the demand for Finger-Paint outside the metropolitan area, found it advantageous to send Ruth Shaw out into the field to demonstrate how this medium was to be used. The first demonstration was given in Indianapolis, Indiana. Since then, Miss Shaw has continued to demonstrate the process in teachers colleges, public and parochial schools, universities, clinics, mental and delinquent institutions, prisons, playgrounds, and camps, covering in the program, each state of the United States.

Finger-Painting soon became recognized as being, not only helpful to children, but of tremendous use to adults in the fields of recreation and therapy, and as a medium for decorative, commercial, and fine art.

In the child's art field, the paintings have often been framed by parents for the home—a significant fact that shows a developed appreciation on the part of the parent. High school students have submitted their paintings in school exhibits. A national exhibit, called "Young America Paints" (23), containing hundreds of finger-paintings of children from all states attests to the fact that young America is painting as never before. This exhibit was given for seven consecutive years (1933-1940). It was held in Rockefeller Center for the first three years and at the Museum of Natural History for the remaining four. It will be resumed when the present conditions are more settled.

As a decorative medium it is being used in many modern homes, not only for pictures, but murals. As an extension of the decorative medium, the development of its use in arts and crafts projects has been utilized wherever decorative paper can be used. Commercially, it has been used for book jackets, book binders and linings, boxes, baskets, album covers, novelty cards, etc. Telfer (56) in 1934, called Finger-Painting a new art for an old impulse and brought out these commercial possibilities.

As a fine-arts medium, the painters have contributed to a collection of Finger-Painting which has been exhibited many times all over the country. This collection belongs to the Shaw Studio and among its contributors can be found such recognized artists as Luigi Luccioni, Leon Dabo, Gaetano Gacere, Duncan Grant, Grant Wood, Glades Brannegan, etc. Francis Fast has held about 14 exhibits in galleries in Boston and New York. Sara Ravendale and Ruth Shaw held a Finger-Painting exhibit at the Ferragil Gallery in New York City, as well as in galleries in the far- and mid-west.

Throughout the whole career of Finger-Painting the phase of recreation, whether it be in the classroom or as a hobby (58), has been clearly emphasized. The pleasure of handling this material has been so great that men, especially, have used it repeatedly. Evidence of this is that Finger-Painting has been put on the recreational programs of the American Red Cross Units, the U.S.O., and service centers throughout the country. The rapport-building qualities of finger-painting between the servicemen and the staff, due partially to his repeatedly returning for more Finger-Paints, brought, it was observed, a more willing acceptance on the soldier's part of other services of the U.S.O. Another observation made, was that the relaxation and pleasure produced by this projective technique, caused the man to tell more of himself and of his troubles. From private sources reports have been made that the tense, war-weary man uses finger-painting for relaxation from his daily responsibilities. It has been reported by various physicians that they use this form of recreation as an approach to the alleviation of insomnia.

Since the very beginning in Rome, evidences which were called "coincidences," showing changes in the habits of known enuretics, stammerers, children with anti-social behavior, etc., became a constant source of discussion at parent meetings. In Paris these same evidences were again repeated, and the idea of "coincidence" began to be discarded because of more accurate observations which pointed to definite patterns in the paintings which accompanied particular behavior symptoms. With these observations began a systematic recording of the children's background and productions. The notes from the school in Rome were also added to the growing mass of data. These records, consisting of the pictures and notes, have come to be known widely as *Miss Shaw's Blue Books.* The technique was continued at the Dalton School where further observations of the 90 children were made and recorded. These records were requested by a few psychologists and psychiatrists who in turn pointed out known therapeutic processes being unconsciously elicited through the medium of Finger-Painting.

In the Spring of 1936, Dr. C. MacAfee Campbell of Harvard University, invited Ruth Shaw to the Boston Psychopathic Hospital to demonstrate and discuss Finger-Painting in terms of her experience. During the conference of staff and students that followed the demonstration, it was suggested by one of the staff that Ruth Shaw should become a professional in order to gain further insight into her work, become intellectually aware, and enjoy her work. Whereupon, Dr. Campbell responded that she was a phenomenon in the teaching world where there is a great need of therapy (such as she was doing) in the classroom and exacted a promise from her that she would not contaminate her pure teaching with psychological literature. He added:

> In fact, don't read a book of those fellows for four years. The

> world is full of cabbages and thistles. In the school room among the cabbages there is work to be done while thistle chasers often have smatterings of learning. You keep in your cabbage patch.[4]

For the next five years, Dr. Campbell had Ruth Shaw appear annually at this Boston hospital.

The Shaw Studio on East 48th Street became a rendezvous for these experts, and although no training was given to these men, we are aware that many are using Finger-Painting for its therapeutic value in their offices and clinics.

Many articles in periodicals and tests have indicated the therapeutic value of Finger-Painting. Menninger (36), Olbrock (39), James (27), Mosse (37), Fleming (21), discuss the treatment-worth of Finger-Painting in relation to the mentally maladjusted personality.

Through the individual's projection during the therapeutic process, certain factors were made known which were diagnostic in character. It was found that the individual's approach, his choice of color and what he did with it, the lines and directions of various movements, the placing of representative forms or symbols, and his verbalization or non-verbalization following the painting, all became significant and indicative to the individual's adjustment or maladjustment in his psychic life.

Work has also been done in the field of therapy in conjunction with the physically handicapped. Watrous describes the useful advantage of Finger-Painting in rehabilitating children affected by paralysis. Cairns (11), in discussing the rehabilitation of the blind, wrote: "Finger-Painting brings into play 'naturally' those muscles upon whose proper functioning manual efficiency will be dependent, but at the same time affords a definitely beneficial relaxation from the exacting tasks used in preparing little fingers for braille."

As an aid to the teacher, to enrich subject material, Rehnstrand (43) shows how Finger-Painting can be used to make the subject matter of geography more colorful and its vocabulary more meaningful.

With the accumulation of clinical records and their findings together with discussions of psychologists and psychiatrists who show interest in this work—many indices so definitely imply relationship between the projections in Finger-Painting and the clinical findings that the main purpose of the writer is to define describe, and present all those evidences which justify the title of this monograph.

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[4] From the personal files of R. F. Shaw.

III. THE MATERIALS

The materials necessary for the proper administration of Finger-Painting include three standard pieces of equipment and other items which may be easily devised or purchased (Figure 1).

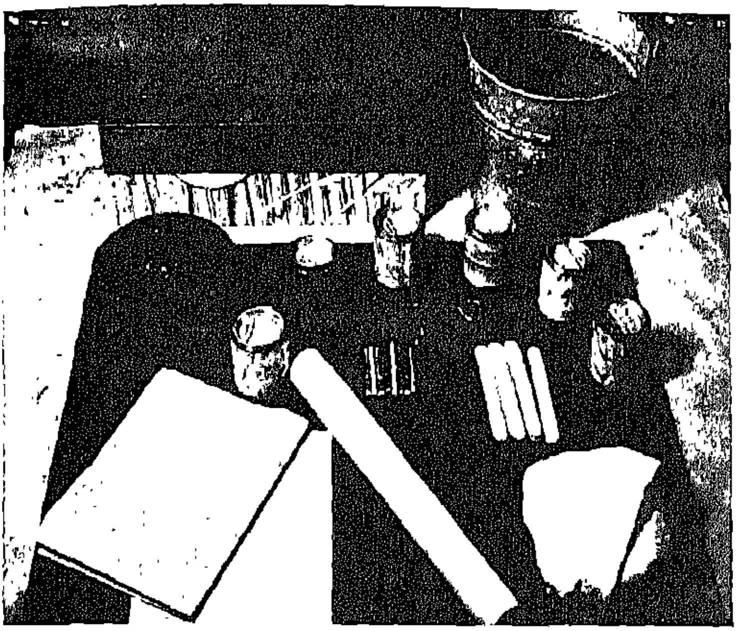

FIGURE 1
A Complete Finger-Painting Kit
The materials include: Shaw Finger-Paints, Shaw Finger-Paint Paper, water resistant surface, large receptacle, small receptacle, pail, wash rags, spatulas, newspaper, pencil, crayons.

Shaw Finger-Paint, as was indicated in the previous chapter, has undergone many changes of the original formula. As a result of these laboratory researches, Shaw Finger-Paint now possesses such advantages that it can be used without fear of the characteristic dangers often encountered with home-made mixtures.

A. The Colors

The six colors used, namely blue, black, brown, green, red, and yellow, are non-poisonous, laboratory tested, earth pigments jointed to a water soluble binder. These earth pigments have an exceptional brilliancy of color due to light reflecting from the infinitesimal facets of the particles, the result of the special grinding process undergone. This brilliancy is not found in dyes which are absorbed by talc or other like carriers of color. The earth pigments do not stain while the dyes—vegetable or synthetic—pass from the carrier to the skin or clothing and do stain. Fast colors in materials are set by other chemicals which may be allergic in reaction to the skin.

In Finger-Paint a desired requisite was to have brilliancy of color for beauty and pleasurable sensation. The fact that these earth pigments do not stain is of psychological importance to the child because of his social relations, and in the forbidding (by the parents) use of Finger-Paint or similar materials should stained hand and clothing results. The non-fading characteristic of the earth pigments are best demonstrated by original paintings of the Italian Masters[5] particularly those who used these colors with a different binder such as oils, egg white, and/or sour milk.

The binder in Finger-Paint had to meet strict requirements in the light of the fact that young children would use it. These desired specifications concern washability, consistency, harmlessness, odor and texture.

The fact that the material can be easily washed off with clear water has easily understandable economic and psychological implications.

The material has to be sufficiently resistant to the hands to initiate a warming up process. At the same time, it causes the individual to exert pressure and movement. It is at this critical point that the individual begins to digress from the world of reality into his inner psychic world of imagination, creation, and projection—*if there is no interference during this process*—this point cannot be too strongly emphasized. Shaw Finger-Paint is manufactured with uniform density to meet these requirements.

Since this material is used in direct contact with the skin, which may or may not have wounds, it becomes imperative that this material should not cause irritation or infection. Not only is this true of Shaw Finger-Paints, but it is a fact that all the ingredients in the binder are advantageous to skin texture. Moreover, it is harmless to children in that it does not contain any substance harmful to the gastro-intestinal tract if it should inadvertently be tasted or swallowed.

There are no artificial odors which may be suggestive to the individual, and which may influence his reactions. There is, however, a natural earthy odor which has shown to have no effect on the individual in his finger-painting productions. Under normal conditions the substance does not turn rancid.

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[5] With the exception of Leonardo DaVinci who experimented with other pigments which, in many cases, turned black.

The texture of this medium must be pleasant and soothing in its use to offer a situation conducive to making use of it. This particular substance contains no qualities which are unpleasant. It is not tacky, or starchy, granular or slimy.

Since it is manufactured according to specific formulae and rigid methods, Shaw Finger-Paint has the added feature of always being a standardized substance with which to work.

B. The Paper

The size of the paper is the result of experimentation with a group of 156 children and adults. Round, square, rectangular, and oval shapes, as well as large and small sizes, were tried. By both careful observation and questioning, it was evident that the average person seemed to work more freely on a rectangular sheet 22" x 16".

The 16- x 22-inch size offers the small child a long reach because the instructions, as will be explained in the following chapter, are, "to cover the whole sheet and go off the sides of the paper." The young child needs this long reach while the adult with longer arms is happy to utilize this size for possible details, since the smaller muscles are more developed at a mature age.

It becomes amusing to those who understand skeletal and muscular development to find some teachers (fortunately not too common a practice) tearing this sheet in halves and quarters for children and asking for still larger paper for older people. A teacher from a Mid-Western town suggested little paper for little children, medium-sized for medium-sized children, the regular size for high school pupils, and larger paper for grown-ups.

The paper itself is tough to withstand the "rubbing and scrubbing" and is surfaced on one side with a clay glaze. It is on this side (glazed) that one paints. The other side is dull and unglazed since a rough surface is needed for suction to hold the paper on the water-resistant table or surface.

Painting on paper as opposed to painting directly on an enameled surface is of the utmost importance for two principal reasons. First, the individual needs to have his story kept for his own satisfaction. Secondly, the clinician needs the painting for the permanent record of the individual's emotional life during the time he is with him.

C. Surface for Painting

There are two considerations regarding this aspect: The surface upon which the painting is made and the height of that surface.

In the order mentioned, the following materials are best as the base upon which the paper rests: battleship linoleum, varnished masonite, porcelain top, water-resistant painted surface, plate glass. Any cracks on a surface makes that surface inadequate to work upon. Oilcloth, because of its fragility and tendency to wrinkle under pressure of hand, is not recommended. Cardboards, magazines, and newspapers are too water absorbent and cannot be kept stationary.

For the best workable conditions it is suggested that the surface be much larger than the paper used, in order to allow for going off the edge of the paper and for the mixing of the paint to be added. When new colors are added to the picture it is feasible to have the new paint of approximately the same consistency as that being used on the paper. Through experience it has been found that the minimal size of this basic painting surface should be 24 x 30 inches.

The height of the table should vary according to the need of the child or adult. A comfortable elevation for work and one at which good posture is maintained, is approximately at the height of the lower surface of the elbow. In actual practice, however, one cannot have a series of tables to accommodate all individuals; therefore, the difference in height can be overcome by the subject's making adjustment with the hips, knees, and ankles. In this way, good posture is maintained without placing a strain on the spine. All adjustments in this regard are made from the hip down. Backaches, due to poor posture, originate from bending over from the waist.

D. Large Receptacle

The large vessel is a pan over 17 inches in length. A width of at least five inches is desirable. Wider pans make no difference. Biscuit pans and such enameled pans as butcher pans, roast pans, and dehydrators all serve the same purpose. A sink with a stopper substitutes very well for this receptacle. For convenience of transportation, a container made by a tinsmith, using dimensions of 18 x 5½ x 3 inches would serve the added function of holding the paints and accessories when storing them. This pan serves to wet the paper to be used. Specific direction for wetting the paper are discussed in the next chapter.

E. SMALLER PAN

Any small pan about five inches in diameter and three inches deep is used as a water supply for sprinkling and moistening the paper to the individual's liking. This is often called by the children "the bowl of rain." It is advantageous to have a pan without handles in order to avoid accidents and spilling.

F. PAIL

A bucket or pail with a handle, half full of water, is used by the individual to "play in after the finger-painting," to remove all paint. This expression is also employed by adults. Many children and adults are reluctant "to clean up" or "wash up"—seemingly resistant to these particular words. It gives an added interest to watch the paint come off "in play" without having to scrub when using the bucket. "Finishing the job" is another expression used with good results in this regard.

G. OTHER MATERIALS

Spatulas, which come with the paint, are used for taking the paint out of the containers. Many children refer to these throat spatulas as a "Finger-Paint stick." Rags are used in finishing up the job and used to clean the table, arms, hands, etc. Cardboards or newspapers are used to lay the finger-painting on to dry.

IV. THE TECHNIQUE OF ADMINISTRATION

All the materials described in the previous chapter are arranged about the patient in a *definite order. This set-up is the same for use with both* children and adults. This particular arrangement has definite advantages, and is the result of years of experimentation. The technique of administration is simple to set-up, easy to follow—and. at the same time, emphasizes order. This latter aspect of order is the first principle of organization in the performance of any job. Design which follows, then becomes the manifestation of order. Teaching by precept requires order even with materials. The following routine is recommended as one which has met with success. It is used by all those who profess themselves to be Finger-Paint experts.

Have each thing in its place and very specifically fixed in the mind of the individual so that there is no confusion within the subject whenever he wants or needs a specific tool. Let the patient wait upon himself. This aids in preventing the individual from continually asking, "Where is the paper?", "Where is the water?", etc. *This curtails any element of disturbance which* may arise within the individual or the administrator. It further helps in establishing primary concepts of self-discipline. Although carelessness may be habitual with some persons and may reflect cetain elements of personality, it is wise to prevent this perturbation through order and allow the finger-painting to proceed without minimizing rapport. Although this aspect is discussed in the next chapter, when the approach to the technique is considered, it is essential to emphasize here, at this very early stage, the necessity of order in the diminution of this reflective chaotic pattern. By precept then, the administrator is setting up an illustration of order to facilitate the administration.

A. THE SET-UP

It is best to have a table just for supplies. *Figure 2 illustrates an ideal* arrangement. The paper should be placed at one end of the table, the pan for wetting the paper at the other, and the paints in the center. This prevents the remaining paper from becoming wet. In the event that two or more individuals may finger-paint at the same time, this arrangement prevents individual disturbance. The spatulas are placed near (not in) the paint jars at the beginning of the process and used when necessary. Once they are used, these "sticks" are to remain in their respective containers until the end. A pencil and several differently colored crayons are also placed on the table. The paint containers are opened for the individual

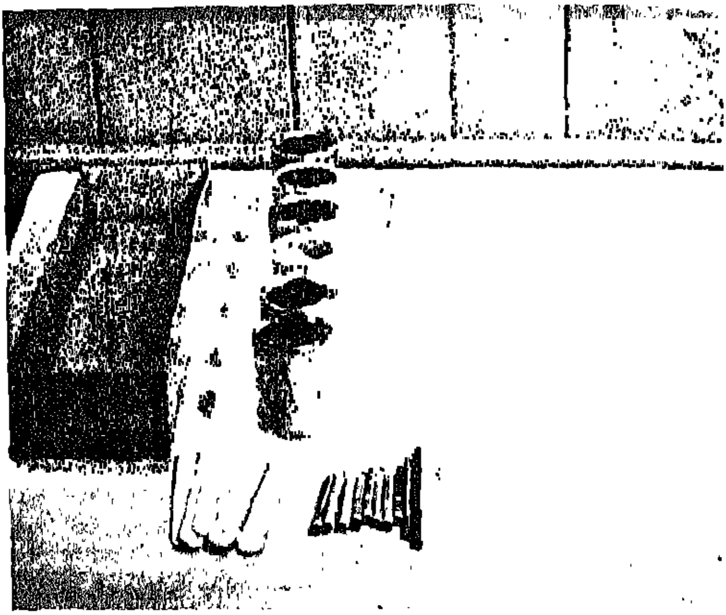

FIGURE 2
THE SUPPLY TABLE

for the first presentation only. Thereafter, being familiar with the procedure, he opens his own jars.

The table upon which the individual performs should contain only the wet paper upon which he paints and the small can of water "for sprinkling" as illustrated in Figure 3. The bucket, half-filled with water, is away from both tables. The distance does not matter, but should be convenient to the subject when he is ready to "clean up." The newspaper or cardboard is placed in such a position that the painting, when completed, may be set upon it to dry without having to be moved later.

B. TECHNIQUE OF MOTION

The administrator, before attempting to instruct the patient in the use of Finger-Painting, should be thoroughly familiar with the materials and adept in the technique himself. In his own exploration of this medium, the administrator should become acquainted with the various parts of the hands and arms which are used in finger-painting. The following parts of the hand and the arm are most commonly used:

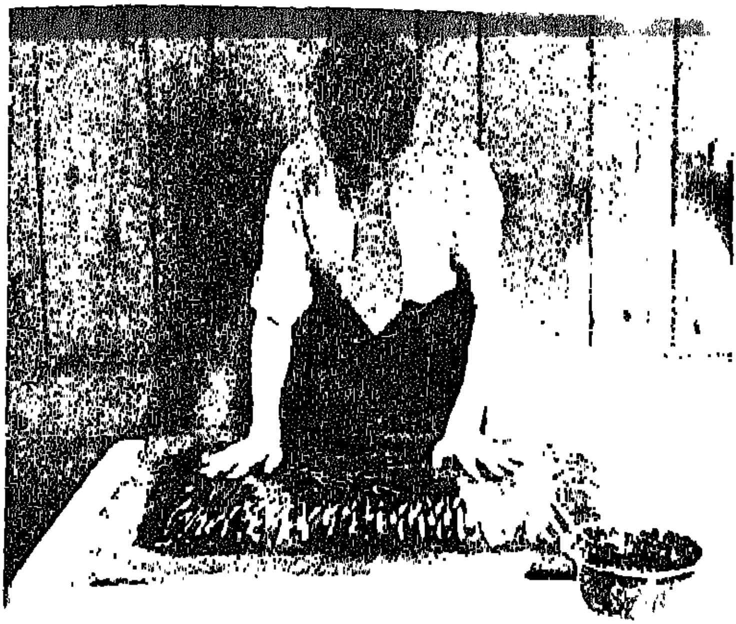

FIGURE 3
A FINGER-PAINTING WORK TABLE

The Hand:

1. Whole hand—flat (relaxed).
2. Flat palm with fingers raised.
3. Lateral aspect of hand with fingers extended.
4. Clenched fist with thumb up.
5. Outer side of thumb with fingers raised.
6. Base of thumb with fingers raised.
7. Base of palm with rest of hand raised.
8. Knuckles (not too comfortable a position).
9. Flat part of finger or fingers (relaxed).
10. Finger tips.
11. Finger nails (use lightly).

The Arm:

12. Whole arm including wrist (relaxed).
13. Fleshy part of arm with wrist raised.

Many effects can be had by the use of any one or combination of the above parts. These results can be further varied with vertical, horizontal, or diagonal patterns. The following all-over patterns can be used in illustrating a number of movements to the patient. At the same time, this procedure eliminates the possibility of the individual remembering or imitating the administrator to any degree in his own projections. The patterns which follow can be made with each of the parts of hands and arm mentioned above—each part producing its respective effect. The patterns can be produced with narrow and/or wide motions.

Patterns:

1. Wiggle.
2. Zig-Zag.
3. Scallops.
4. Straight lines.
5. Circles. Use various parts of the hand as you would a compass; hitch your hand as you circle it.
6. Vibrations. Jerk the part of your hand as you move it. Exert much pressure on the ball of your finger or thumb and there will be automatic vibrations.
7. Use pressure to get contrast.
8. Patterns 1-7 can be combined with alternating narrow and wide movements.

Avoid the use of only one finger. So many people are conditioned to a writing instrument that they may be led to draw with one finger. If a child draws with his finger, it becomes an important indication of his conditioning pattern. It is here that interference prevents this pattern from changing to a freer agent. This is significant in teaching as well as in therapy. Finger-painting represents mass in motion (outline and content) while drawing mostly delineates the extent of mass in space. Each discovery as an all-over design should be repeated to impress it on the memory and to give grace to the gestures of the administrator.

C. THE DEMONSTRATION

In setting a pattern for directions for the individual, the administrator demonstrates the routine of procedure and carries on a "patter of conversation" about what he is doing so that the individual may portray his version of the story. The story of the administrator aids in rapport building. It has been found difficult for some individuals, be they children or adults, to tell their story. This may be because the administrator has given them no pattern of "telling a story." It is difficult for the so-called normal person to tell a story extemporaneously; we must at times, therefore, expect greater difficulty with persons having personality disorders. It can be added here, that by story telling is not meant a definite plot with an ending or moral, but rather a pattern of conversation "telling what you are doing, what you are trying to make, or identifying what has been just made." At the same time, the administrator, having already learned to manipulate his paints, may paint a picture, an abstraction or a pattern. He should practice to be verbally articulate while painting, i.e., keep a running patter of discourse on what he is doing.

D. The Procedure

The routine procedure is carried out in three distinct parts, each part leading into the next. These may be divided into: (*a*) preparation of the process, (*b*) painting through the manipulation of the materials, (*c*) finishing the job.

1. *Preparation of the Process*

a. Finding the sides. After the material has been arranged as previously described, the administrator takes a sheet of paper and feels it (with his skin) to determine which is the glazed side. The blind often use their chin or face to decide which side is the smooth one. They rarely make a mistake. The glazed side is used for painting. The other side, being unglazed, readily adheres to the table or board preventing the paper from moving. This unglazed side is also used for the recording of name, date, and other pertinent data.

b. Identification. The name and date are the essential identifying data needed. Any other information such as address, school, parents, etc., may be added. The individual is free to place these data on any part of the flat side he wishes. If the individual cannot write, has not learned to write, or does not wish to write, have him "make his mark" so that he may identify the paper as his. The patient is told he may choose any one of the writing instruments he wishes to do this.

c. Wetting the paper. Roll the paper with the flat side toward you. Turn the roll on its horizontal axis. Using both hands grasp the loose edge between the thumb and index fingers at the same time holding the roll with the remaining fingers. Submerge the edge of the paper deep into the long pan of water at the same time releasing the roll completely except for the edge (thumb-index grasp). Draw the paper through the water slowly, completely wetting it. Lift the now wet and open sheet directly over the pan tilting it so that the excess water drips off the lowered corner into the pan.

d. Preparing wet paper for painting. Holding the wet paper by the edge bring it to the operating table and place it smooth side up. This can be easily distinguished since the other side now has the name and date on it. Before beginning to paint, it is necessary to remove all wrinkles and air bubbles from the paper. This is done by placing the hand on a smooth area approximately toward the center, lifting up a corner of the paper and sweeping the hand toward the outer edges, thereby removing the wrinkles and expelling the air bubbles. This procedure is continued until a completely smooth workable surface remains. If not done the wrinkles and air bubbles will crack the paper during the painting process.

e. Beginning to paint. The individual is then told to go over to the table where the paints are. He is allowed to choose whichever color and spatula he wishes. Never suggest colors. After the color is chosen the container is brought to the wet paper on the table. The individual is told to "take as much paint on the stick as you would ice-cream on your spoon—if your mother wasn't looking." This statement is used for adults as well as children. He then returns the jar of paint to its proper place so "others may use it."

f. Posture. Returning to his blob of paint on paper he assumes a posture which is comfortable, relaxing, and permits free use of skeletal muscles—in other words, he is well balanced. "The feet are placed comfortably apart to permit good wide base for the body. With the feet as far apart as the width of the hipbones, then hold your tummy—pull it up and in, so that you don't get paint on your clothes. Hold yourself in, in back, so that people passing behind you don't bump you." Special care should be had with females to see that the hip bone axis is parallel with the floor. This affords a level base for the spine.

2. *Painting Through the Manipulation of the Materials*

a. Manipulating the paint. With the palm of the hand over the paint commence moving the hand; throwing weight on the hand move—move—move in any direction one likes until the paint is worked up very smoothly. The paint is deliberately made rigid so that it causes sufficient resistance to effect a warming-up process. When the paint is smooth the subject "sprinkles" water and the paint becomes more flux. It is more easily spread over the entire paper. Allow the individual to go over the edges of the paper because the individual should not be limited in movement by even the edges of the paper. In moving the paint about the paper, forms appear which are apt to lead the patient to describe them as something reminding him of an experience in his life and his reactions to them.

The younger the child the more abstract the forms and the more vivid the descriptions will be. For example, a two-and-one-half-year-old child, in Paris, Elizabeth, sweeping her hand back and forth called it the wind; hands up and down the sheet she called trees; patted it with fingertips and called it first, rain, then, flowers. She turned and said she once saw the wind and the trees and then the rain came, then May, then flowers. She called it a pretty story and said it was red because red was pretty to her. As the person paints, he will exclaim with pleasure or displeasure, "This looks like so and so. I know it cause I saw it."

b. Interference. Keep wetting the paint to keep the paint obedient. As the person proceeds he will rub out things again and again because he saw the administrator do it. The administrator, while the individual is "exploring his world," should not interfere with questions or with the performance proper. This might make the individual change his mood and frame of reference at that particular time. However, it is permissable, because it is quite human, to laud achievement in order to encourage productions. At times, although commendation is pleasurable, an individual may erase the thing admired showing his discontent at even this type of interference. In such cases, the administrator should be very careful of interfering either pro or con with the production or creation. If the individual has had no interference he will work up to a finish and then stop working or say he has finished. The individual time span varies.

c. Drying. If the child is young and needs aid, the administrator may help him in putting the finger-painting in place to dry. Otherwise, the individual himself picks up the finished painting by the corners and places it on the open cardboard or newspapers—which have been previously prepared—to dry. Drying time approximates an hour, depending upon the consistency of the paint applied. For purposes of record filing it is suggested that the painting, after it has been thoroughly dried, be ironed on the reverse side with a moderately hot iron. A hot iron will scorch the paper. In institutions where a laundry is usually maintained on the premises, many finger-paintings can be ironed at one time by putting them through the mangle. At this stage it is also suitable for framing.

3. *Finishing the Job*

This third phase, that of finishing the job, is just as important as the approach or the activity itself. Many people begin things with enthusiasm only to end their task inadequately and incompletely. Here the individual is given the opportunity to indulge in this important phase of the job—cleaning it up. Avoid using the words "clean up" and "wash up" because many people react unfavorably—consciously or unconsciously—to these phrases. As one 11-year-old boy, Jerry, said, "Clean up! That's what women have been telling men to do since the very beginning and I'll be damned if I'll clean up." It was he who gave the clue to the phrase now used: "Finishing the job." He added, "Don't tell men to clean up, especially if the men are new" (i.e., he is a young boy). Upon inquiry of what should be said he replied, "It's so simple—you should just let them finish their job."[6]

a. The bucket (pail). The bucket, half filled with water, is used to finish the job. By "playing in the water the paint comes off easily." After the patient has removed the paint from his hands and arms with the rag he squeezes the rag and washes the paint off the table or board. During the time of "playing" (cleaning), patients are often so relaxed and loquacious that it is the usual procedure for the administrator to place himself near the bucket so that he may become part of the conversation by joining in, adding to, or listening to the individual.

b. Verbalization. At the very beginning of this conversation, let the individual understand that the administrator deals with a lot of people and cannot remember everything about everyone, and finds it necessary to jot down parts of it to recall it later (for the next time he paints). Many individuals, seeing their words recorded and feeling that they will be kept against them, usually don't reveal their "stories." If the administrator has an acute memory and can record these post-painting stories immediately afterward so much the better. At this time, a dictaphone or a recording outfit will be helpful. There are usually three places where one can expect to get stories: (*a*) while the subject is painting; (*b*) while his hands are in the bucket; (*c*) when he volunteers to talk about the painting. If the individual refuses to verbalize then say nothing about it. The relationship should be kept a pleasant one. This can be accomplished by terminating it as a passive interview with the administrator himself speaking more fluently. Sometimes lack of praise and recognition causes the patient to be silent. At other times, it is due to personality factors which will be discussed in the next chapter.

E. MISCELLANEOUS NOTATIONS

Have it understood that pictures made are not to be taken home. They are primarily reference cases for study, and must be filed. In the event that he wants to make a picture for his parents, teacher, friend, etc., then allow him to make another one to take with him. This fact together with the name of the one for whom he is making the picture should be recorded. If any reasons can be ascertained why the extra painting is wanted, they too, should be recorded.

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[6] R. F. Shaw, from her personal notes.

The administrator should make the individual feel at ease at all times. He should keep his patient in such a mood that the subject is actively participating in as well as being receptive to this experience.

Finger-Painting is not an art lesson. Criticisms concerning creations are out of place when this device is used as a projective technique. If a child makes an X and calls it a house it is accepted as a house.

The administrator must sincerely feel his admiration for the interesting productions of the individual.

Only one question is ever directly asked about the picture. If the individual in telling his story has not given it a title then he can be asked for the title, and it is usually written on the back of the picture when ironed.

If the individual is afraid of soiling his clothes then an apron should be provided.

If the individual did get paint on clothes, suggest or help him remove it with clear water without making derogatory remarks.

If an individual using an apron doesn't soil it, praise him highly for it. Don't offer or give him an apron the next time.

If the individual says, "I don't know what to do"—he needs help. Help the individual by standing in good position behind him and putting your hands on his shoulders swaying him; or if he needs further help, slip your hand over his arms and guide them. Often those who are very tense and need this type of encouragement find release for their tensions when you comment on what their hands have made. Never put your hands directly on their paper or on their painting.

The time for administration varies. An average administration approximates one hour.

If an individual wishes to make more than one painting allow him to do so, but record on back of the paper the order in which they are made.

All paintings are to have the name and date on them. Some do not recognize their paintings until they have seen their names on it. Others refuse to acknowledge it because of the revealed productions or because they are "not good." A few have said that it was not theirs because they "couldn't have made anything so beautiful." Still others reject their past performances.

In the event that more than one individual is painting in a room at the same time—with the success of one individual being an obvious thing and being commented upon by the administrator—others or even the entire group may try the same thing. This is an immediate response to a dominant personality. If the situation is handled correctly, i.e., in a casual manner, these copyists will eventually return to their particular type of painting if given equal praise.

Some have reported that all children do the same thing. This is not the children's fault. Rather, it is caused by improper methodology being used, especially in the classroom.

Completing these mechanics—the essential foundation—the reader is now prepared to enter the next significant phase, that of describing the process.

V. THE FINGER-PAINTING PROCESS

During the Finger-Painting process the expertness of the administrator is of inestimable importance. Handedness, color, motion, rhythm, texture, balance, order, symbolism, and verbalization are the important categories in the Finger-Painting process. These nine categories call for responses from the inner psychic pattern of the subject because their attributes have actual potential fulfillment value for the subject. Although these principles are similar in each, their development varies.

Through the newly aroused reactions of the subject to the administrator and his demonstration—and all subjects are affected *to some degree* by the demonstration—the subject shows interest, desire, and the will to participate. This self-motivating determination to manipulate the material unlocks many facets of experience and reactions to these experiences which are etiological factors of behavior and adjustment. During this situation the subject becomes the teacher concerning his inner psychic life, and directly or indirectly, reveals productions pertinent to his personality.

The theory of each category mentioned will be presented and described in terms of Finger-Painting.

A. HANDEDNESS

The hand becomes significant because it is the instrument by which the other attributes are given expression. The whole of the skin has in the past been neglected as an "in-taking" as well as "out-going" organ. The hand, because of utilitarian aspects endowed with more nerve endings per given area, is instrumental in disclosing certain "clues" as to the pattern of the subject's behavior. These "clues" are manifest throughout the eight remaining categories.

The question of how the hand has any relation to color may be raised here. It is acknowledged that the average person has not developed to capacity his hand and his skin because of the use of his other senses of perception, especially the eye. However, some blind have a highly developed sense of touch in which they have been known to distinguish color through sense perception other than visual.

The majority of people through finger-painting data show right-handed dexterity. A very small portion show ambi-dexterity. The remaining left-handed group can be subdivided into two divisions. The first include those who are left-handed and have been allowed to use their left hand. The second division includes those who are left-handed, but have been forced or conditioned to use their right hand. In this latter subdivision are found a number of subjects whose present personality problems are caused by interference by adults during early childhood.

There is still another group which includes the physically handicapped such as the spastic, the paralytic, and those with crippled hands.

In cases of spastics, where the disabled member is the right hand, the person is forced to use the left hand because of lack of capacity with the right. The successful adjustment or rehabilitation with this group depends on the re-education of mental attitudes (as stimulated by the therapist and the family) and not upon physical function. This concept is especially prevalent in those hospitals where servicemen have amputations and are undergoing rehabilitation to return to civilian life. Extensionalizing the theory of handedness from the findings in finger-painting, it would appear that there is failure in rehabilitation unless the physician, nurse, and occupational therapist in the hospital are successful in developing a positive attitude in these veterans, plus the attitude of the people at home and of employers when they return to civilian life. Unless, in addition, there is natural follow-through of this positive attitude from the initial start by the therapist, through all social channels that follow, there will be danger of residual mental trauma affecting the individual in his living. The same could be said of a left-handed person who has lost his left hand, and is being restored through the use of his right hand.

It will be observed that the infant who has not yet been conditioned to any one handedness, will use both hands in his painting, indicating that as a whole the human organism is potentially ambidextrous; and, at such time, hasn't learned or been taught to prefer one hand to the other. Following this idea, it is interesting to note that quite a few adolescents and adults often ask permission to use both hands in the painting. Given permission they will paint with both hands for a long or short duration, but will always finish the painting with the dominant hand.

In cases of true left-handedness the subject often asks permission to or apologizes for the use of the left hand. The person who uses the right hand as a substitute for his left hand will often deny his left-handedness.

There are some schools of psychological thought which feel that some of the stammerers and bad spellers belong to the group of changed-over handedness. Wheeler and Perkins state:[7]

> It is well known that changing over a child to the right hand who has developed left-handedness is a disturbing influence in his development. For a time his whole movement-system is thrown back to an

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[7] Wheeler, R. H., & Perkins, F. T. *The Principles of Mental Development.* New York: Crowell, 1934.

> earlier stage of mass action, with its gross types of response and awkwardness. This awkwardness is not only shown in hand, but in all body movements requiring delicate coördination, including speech The whole situation discourages the child, makes him self-conscious, increases his emotional tension. Recent studies by Travis, indicates that many stutterers have been children who have been changed over from left to the right hand.

Many stammerers disguise their stammering so that it is often not obvious to the examiner. However, finger-painting, to the initiated, will reveal this disguise.

B. Color

In discussing color the writer is not considering color from the point of view of the solar spectrum with its various wave lengths nor of the colors of the artist's palette. Neither is he concerned with the color preference of the individual. He is however, concerned with the color to which the personality of the subject responds and through which he manifests his particular personality. Man has recognized that certain colors seem to be identified with emotional states and has expressed it through his proverbs which are the wisdom of the ages. The examples which follow illustrates the idea: In the 23rd Psalm "green pastures" represent security, peace, rest, and faith. Green is also spoken of in literature as referring to evil as in "the green-eyed monster of jealousy and hate." Studies in Finger-Painting have indicated that certain personality types definitely show affinity for certain color choices and color combinations.

It has also been observed in Finger-Painting that choice of color is the result of different meanings attached to these colors.

The colors used in Finger-Painting are blue, green, red, yellow, black, and brown. Combinations of the above are used in Finger-Painting to give three additional colors namely, orange, purple, and "mud."

To the subject who is painting, the tones and shades evolved are accidental in his experience. The recognition of these new colors and the ability to repeat the making of these colors add to his experience and hence to his development.

In general, according to their respective color choices when compared to the clinician's description of the personality as recorded in the case records of these subjects, blue and green are the dominant colors for the male while red and yellow are dominant female colors. Black and brown have little significance difference for either sex. However, black is used much more often by normal males than by normal females. A note of caution may well be inserted here to the effect that the interpretations which are given to the colors depend upon the meanings that the subject attributes to the particular color. This appraisal of color choice is in direct proportion with the administrator's clinical experience with this particular technique.

Orange is rarely used and very infrequently seen in finger-painting. Sometimes individuals experiment to make orange, but more often they are satisfied with red or yellow.

"Mud" is not a color, rather, it is a condition arrived at by mixing too many colors without any forethought or any plan or goal. With some there is great delight and joy in playing with these destroyed colors.

An interesting experiment, especially in a group, is to bring up naturally the subject of color and ask for the color preference of each individual in the group. Often the color preference has to do with the color in an immediate past or present experience. It may be so recent that it can be a color just chosen by a friend in the group. This color preference has nothing to do with the color actually chosen although it may be the same color. It merely means that the individual has been influenced by a recent experience. In a painting series a individual will confirm his color choices by the predomination of a particular color throughout the series.

C. Motion

One realizes the importance of the hand and its related parts as being the significant instrument through which the personality is extensionalized. The directing force behind the hand is the muscular construction of the body. This physical structure is activated, stimulated, retarded, or varied by the personality directing these forces at a given time. This given time exhibits the patterns, habits, and responses indicative of past experiences and present stimulus, which set the present movement patterns of the individual. These movement patterns are demonstrated continuously during the finger-painting process.

The subject displays his attitudes through muscular movements to which he has singularly given labels. These labels originally coined by children actually experiencing the motions while finger-painting, are here presented and used to describe various movements, and the degrees of these movements as being common to human beings in our civilization today. In observing and assembling these various movements it has been found that practically all finger-painting motion falls in any one or combination of the 11 general types, namely:

1. smearing
2. scrubbing
3. scribbling
4. pushing
5. pulling
6. patting
7. slapping
8. scratching
9. stubbling
10. picking
11. tapping

In the paragraphs that follow each type of movement listed will be described.

By *smearing* is meant the unskilled, undirected movement of large muscles. This type of motion is best demonstrated by an infant's undirected motion of arms and legs as preliminaries to the skills of the subsequent first activities which are characteristic of his age group. An infant given finger-paintnig will resort to this basic principle of smearing. This is true with other age groups since smearing is basic to all forms of development of muscular skills.

Smearing is also basic in orienting oneself through muscle movement to his immediate environment. The more skillful an individual is, the less smearing he does to orient himself. Smearing, as a basic movement, is further demonstrated by the administrator when rubbing the paint smooth, which at the same time activates a warming-up process. Good smearing is done with the whole hand and with the weight of a well-balanced body behind it. As one child said, "I paint with the spot in the middle of my back."

By *scrubbing* is meant a hard rubbing motion with the whole hand or hands in a given direction. This direction may be up or down, left or right, or in circles. Scrubbing is an advanced step over smearing as illustrated by a person scrubbing to clean—it has a definite purpose. Scrubbing could be called directed smearing. This type of scrubbing is constructive in nature since it shows the mind directing representative mass. The body is relaxed and subservient to the desire to achieve. There is great pleasure in this movement especially with little girls. Another type of scrubbing is illustrated by the individual who is antagonistic to the situation and tenses his body because of inner drives. He will scrub but he is sloppy and indifferent, and with undirected force becomes chaotic in his movements. At times this chaos may extend to going off the paper and spilling water and paint.

Scribbling is described as isolated finger movement imitating pencil writing. Scribbling is more detailed, but less directed than scrubbing. Many children are given pencils and paper too early in their development. This is usually done by parents with the hope of discovering early talents or as a time-killing activity. It is unfortunate that most adults do not know what instruments to use at a particular level of child development. The human being first comprehends representation through mass in movement in space and not a point in movement which describes the extent of mass in space. Therefore, scribbling becomes an activity with an adult tool used in the advanced art of drawing and is, therefore, not adequate in the development of children's skills.

If a child scribbles in finger-painting he is attempting to draw, a process above his level although not so with the adult. Many will draw because of their conditioning and in finger-painting one allows these to continue to do so as they are portraying something about themselves. Allowances are made of course for the professional artist and draftsmen who are skilled in this respect. Doodling, often thought of as scribbling, really is smearing with a point producing design, rhythm, and repetition.

There are many variations in scribbling. For example, there are the variations in the use of digits in scribbling. The index finger is most commonly used since this is the finger greatest conditioned by pencil use. Scribbling with all fingers is usually labeled by subjects as "macaroni," "spaghetti," "worms," "snakes," and may become a springboard in mass painting because of a lack of satisfaction in results. However, one should not confuse this with motions made with fingers as in painting a definite object by rotary motion in mass since this latter motion is directed and controlled in making representations.

Pushing out is considered a giving out motion expressed by upward and downward movements away from the body with emphasis on the up or out stroke. There are two kinds of pushing movements. One type where the giving out means articulation or extroversion. The individual here entertains other people and the world of reality and finds joy merely in giving. With the second type, this pushing movement really means "getting rid of" or "putting out of the way."

Pulling in is considered a pulling in toward the body expressed by upward and downward strokes with the emphasis on the pulling in or down stroke. It is interesting to note how some pull down to a lower center of the page and some pull down so far as to go off the bottom of the paper and often on to themselves. At times, pulling in motion may not be representative of the personality, but occurs when the administrator or the environment becomes an obstacle to his creation and becoming self-conscious begins to pull in.

Patting is described as gentle recurrent striking with the inner surfaces of the fingers or hands. This patting may be extended to the whole hand or the heel of the hand. The child usually discovers new imprints of the lines of the hand and this usually furthers his discovery by patting harder.

This may be confused with the slap, but it is still considered a pat because there is no deliberate violence attached to it.

A form of patting done with various isolated parts of the hand such as finger tips, heel of the hand, fist, etc., give an easily recognized imprint in the painting resembling *stippling*. It must be remembered that these movements which are used now for a desired effect in representation had their origin in the experiences in patting or slapping. They now show better adjustment in the patient because the emphasis in purpose has been changed. At times, his antagonism to the paint, representing mass, may be so acute that he adds much water so frequently to wash away the mass that he often finds himself working with too wet a paper. In this instance, it is advisable to suggest that he change his color or add more paint.

A variation of this use of the finger-tips (stippling) can be called *tapping*. Tapping is used often in making leaves of trees and flowers. This movement when used in a violent manner usually portrays the subject's anger and hatred for the object or person that it represents to him. Tapping in this sense is uncontrolled and covers a larger area than the controlled tapping. The controlled tapping is a variation of the pat used for certain effects.

Slapping is the intensified strike of the palm of the hand and is usually motivated by anger, defiance, antagonism, or inadequacy. There are two distinct types of slapping. One is the repeated slap and the other is the slap of violence. The repeated slap is a continued series of scattered slaps which the instructor usually finds annoying, and which is used by the individual who shows resentment. This motion will be repeated until the patient's attention is diverted through the presence of others in a group. The slap of violence is usually of short duration, and more often limited to one slap. The individual who uses this motion does so as a substitute for an explicative. The violent slap is often accompanied by a surge of shame in the patient. A more hesitant slap of this type is usually done by a person of mischievous nature in order to splatter himself as well as others. A movement made up of violent single slaps is referred to as a slap of violence to kill. This is often accompanied by verbal expression.

By *stubbling* is meant short-spring-like strokes made with the first joints of the fingers held stiffly. While the dictionary defines stubble as "stumps of grain left sticking up after harvest,"[8] the child has labeled a certain, short, sharp motion with stiff hand and outspread fingers as "stubbling." This has been associated in children's narratives such as "three goats gruff" associating their stubbling with pain and disappointment. Many individuals who have buoyed-up emotions find this stubbling a sufficient stimulus to serve as an outlet for this pent-up feeling.

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[8] Concise Oxford Dictionary, 3rd Edition.

Scratching is a violent pulling down movement with finger-nails. It is always a pulling down motion as it is obvious that one cannot scratch unless he pulls in. The pulling in may be directed from left to right but always it is a pulling in movement.

It is not an infrequent thing to find that some of the best examples of projection bear the scars of scratching in the earlier movements of productions. The person has apparently had to overcome terrific emotional barriers in order to reach the position where he could agree with himself to have sufficient confidence in the administrator as to tell his story. It is significant that the subject reaches the conclusion that he could trust the administrator.

The astute administrator stints in his praise of the finished products and although he observes them, he never makes known to the subject his observation of these underlying scratches. If the administrator were to refer the subject to these now hidden scratches, the subject would lose his confidence in the administrator, and would show this by his great reluctance to re-establish rapport.

At times, patients go so far as to tear up the whole paper before the administrator. It is not always a violent person who does this. Often a quiet person—non-violent—shows his reaction by gritting his teeth or slamming the door on his way out.

Picking is a caressing form of plucking done with the pads of the tips of the fingers. As the painting process continues, more and more of the hand is gradually brought into play. This type of motion has no representation since the movement is a goal in itself. Quite frequently the hand which is painting remains in sight while the other hand may be surreptitiously sucked or bitten. Often the suggestive quality of the movement may be so intense as to cause the subject to ask to leave the room.

D. RHYTHM

Rhythm, in finger-painting, means the ability to repeat a definite motion in a certain time pattern. The motion may be singular or in groups separated by a block of time. The block of time is the receding part of the rhythm or the pause which is as important as the motion. Typical rhythms in finger-painting are characterized as in music, i.e., 2/4, 3/4, 4/4, 6/8, and in addition a 5/4 and 7/4 rhythm.

It is very interesting to note that these rhythms are even and odd. The male most generally expresses himself through even rhythms, and the female expresses herself through odd rhythms. A fascinating illustration of this phenomenon is to observe military marches among the sexes. The rhythm of 'one, two, one two, left right, left right, is typically male and easy to walk to in a natural, well-coördinated, balanced march of martial music; while the Waves, Spars, and Wacs have a natural 3/4 rhythm and the third beat seems to be taken up by a twist of the body or a swirl of the skirt giving a more colorful show of movement; or they will follow the music by left right left, right left right, etc. The writer has observed that in the dance, too, more women than men prefer the waltz which is a 3/4 beat and is, therefore, the natural rhythm for the female. Conversely, the male seems to prefer the slow fox-trot which is a 2/4 and male rhythm.

Common rhythm of the masculine type in Finger-Painting is one two, one two, one two. A variation of this type as he approaches mature development is 4/4. The creative male who uses purple or blue-green as his color, generally exhibits a 6/8 beat which, in Finger-Painting, is ambivalent rhythm. By ambivalence there is meant using both male and female rhythms (as purple is in color).

The female uses 3/4 rhythm and only in cases of imitation does she use 2/4 or 4/4 beat. Her highest development is a 6/8 beat. She is naturally 3/4 and 6/8, but often "apes" the 2/4 and the 4/4. The greatest variable in a female rhythm is a 5/4 and 7/4.

There is a close relationship between rhythm and color. Rhythm may be expressed in finger-painting by the number of objects, by push and pull movements, and by circles. Caution is made here of the necessity of observing very carefully how a person works while finger-painting.

Although this category is briefly written, yet the writer considers it a very profound one by its implications. The evidence for the above is repeatedly observed by the Finger-Paint expert.

E. TEXTURE

By texture is meant the consistency of the paint after the subject has finished his preparation of working and smoothing it out. The ideal mixture is for the paint to be smooth and sufficiently wet as to be utterly obedient.

The smoothly prepared paint with the correct amount of water added is indicative of the obedient, coöperative person who wishes to excell in his desire to create. Coöperation and ability to follow directions shows obedience to the situation and in like manner demands obedience of the material with which the subject is to work. People who demonstrate this behavior in finger-painting are among normal personalities who, if affected by strong emotional maladjustments, are amenable and respond quickly to therapy. These individuals soon discover what parts of the hand will do, will work to a finish more quickly, and who, if they change pictures, will add water each time they use a new color, they are freer and more flexible in their movements. They do not plod over one picture too long.

Lumpy and dry paint is considered inadequate texture. Individuals arrive at such a texture because they have not smoothed out their paint nor added sufficient water to enable them to manipulate the paint easily. This type of texture causes resistance to the subject. It is of interest to note that these individuals are not aware that they are the cause of their own resistance.

Lumpy and very wet paint is also considered inadequate texture. Individuals who arrive at such a condition, unaware, too, causes his resistance by not working out the paint and apparently adds too much water in a defiant manner. This type of defiance usually leads to a catastrophic situation. They become helpless in such situations in "drowning out" and leaving the cleaning up or completion of the job to the others. However, this performance is normal for the young child who has no valuation of quantity, and not enough persistence to rub the paint smoothly.

There is another inconsistency in which the paint has been used and is kept very wet, at times to the extent of flooding the paper with water. This too, is of inadequate texture. This texture can be described as having little paint and being very wet.

Another extreme is using smooth paint that has been allowed to become too dry and is, therefore, of inadequate texture. This is found in the situation where the paint has been worked a long time and very smoothly so, and covers the whole surface with equal spread. These people have spent so much time covering, that the water has evaporated, leaving the paint dry. They never add additional water. The consistency is very smooth. They use finger-paint as if it were a scratch board or etching surface, using mainly fingers, finger nails, and thumbs. They draw rather than paint, many wear out the paper from working hard and long.

The individual, however, will vary his texture while painting as he is influenced by, or submissive to, the suggestions of the administrator. This variation may be carried over to the next painting, or he may resort to his original texture pattern according to the degree of his maladjustment. It is interesting to note how long it will take some to correct their texture and how quickly others will take to change. This aspect is one of the clues, the writer believes, to checking the original diagnosis during therapy. The reader may recall a statement made previously, that to get the total personality picture, diagnosis must be checked continually while therapy is in action.

F. BALANCE

Balance in finger-painting means the equilibrium of body stance, the projective thoughts in performance, the harmony of design, the proportion, and the repetitions in composition. There are two kinds of balance in finger-painting—one as expressed during the performance (body movement) and the other in the composition of the painting (in report).

The significance of the physical performance is adequately described in its appropriate place in the next chapter. We may insert here, however, that if physical stance is not good but the picture itself is, then there have been certain compensations as made with the physically handicapped and crippled. This compensation has been in terms of intellectual comprehension. One finds in therapy that if the causes of the persistently bad posture can be relieved the picture may not be as good as formerly. Yet, with re-education, these pictures progressively improve.

Composition in general has to meet the laws of symmetry. The writer is not interested in these laws from a fine arts point of view. In finger-painting, the composition of a picture has to be weighed according to the criteria which the subject sets up for himself as an indication of the stage of his development in exercising a natural function such as balance. His understanding or lack of understanding is a clue to the administrator to the status of his knowledge and personality adjustment.

G. ORDER

Order is an interesting force that holds the world together. Man, as part of this world, finds that phenomenon existing within himself. Thus far in our civilization, order has been achieved through the teaching of sequence plus free function of the natural forces within us plus the ability to form habits through routine.

With finger-painting the individual has to be given structural sequences—as contingent rungs of a ladder on which he climbs to a state of creating on a functional level. The administrator must be "hide-bound" about giving the directions for procedure, allowing no deviation—else confusion results, i.e., the individual will spill water, fail to write his name on the paper, fail to finish the job, etc.

The child more often adheres to the directions than the adult, probably because the child's habit and attitude formations are not as fixed as those of the latter. After the person goes through the routine of the procedure, then he creates—which is his free functioning privilege. Order on the part of the administrator then becomes "absolute non-interference" through questions or suggestions or participation in the paintings in any manner.

From order has come the creative process, creative impulse, creative urge which is that delicate ephemeral quality of the total personality, which like a butterfly's wing can be ruined by a rough hand. Therefore, the administrator must be so qualified that he can enhance, yet not participate in, the individual's creativeness.

The order of procedure in this technique is not the total order. Equally paramount is the order of rapport in which the administrator teaches procedure. In turn "the painter" teaches the administrator through his creative flow the things that lie within his total personality. Rapport is a continuous reciprocal process. Instruction is important, but the perversion of instruction becomes interference—perhaps the greatest crime committed by adults toward the young.

To repeat, it is of utmost importance that the administrator be familiar with the procedure and the significance of his interference directly or indirectly with the process.

H. Symbolism

During the demonstration by the administrator no emphasis was laid in the type of movement, selection of color, representation, or verbalization. All these are symbols in nature. Color and movement have already been discussed. Symbolization as representation in finger-painting may be abstract, or approaching realism, or a form of association. These symbols have universal usage because individuals have kindred experiences. However, these symbols have not the same universal meanings. They vary according to the individuals and time. Meanings may be different within the same individual at different times.

Typical symbolism in finger-painting is portrayed, according to the level of progressive development of the individual. These different levels of development are portrayed by mass, mud, underwater scenes, fish and incidentals under water, snakes, monsters, and reptiles. On a higher level of development one sees portrayals of attempted landscapes with earth, water, sky, sun, darkness, night, trees, plants, and then men and houses. In the higher levels of development portrayals of activities of man and abstractions and ethereal concepts are also seen.

Deviations and distortions of these general symbols are interpreted according to the chronological age, developmental age, and the verbalization which the individual attaches to his painting.

The symbols used are as varied as the individuals themselves, and those experiences which they feel a compulsion to use in order to relate something about themselves. In finger-painting one becomes aware of old symbols, new symbols, and rare symbols all of which are so numerous they can only be spoken of in general. The clinician develops interpretation of these symbols through the clues available during the finger-painting process plus the subject's verbalization or hidden meaning, judged through his own comprehension of the general meaning of symbols. Symbols are of the greatest importance to the human being because communication is made largely through symbols. All of the categories mentioned and discussed are, in reality, symbols through which the individual has expressed himself. The interpretation of the symbols of representation is perhaps as important as any one of the others. Symbolization of representation in finger-painting becomes more important than verbalization because of the predominance and universality of the former and the inadequacy of the latter.

I. VERBALIZATION

By verbalization is meant the story the individual attaches to, or uses to explain, his finger-painting to either the administrator or to himself. Verbalization in finger-painting is often found to be difficult. It is hard to use one set of symbols (verbal) to describe another set of symbols (projections in finger-painting). This difficulty is due to the fact that a vocabulary far beyond the ken of the individual is often demanded. Communication is more possible with this medium because "through finger-painting a person can often express thoughts for which they have no words."[9] Also, articulation is hampered by the lack of clarity of meaning of the words used (semantics) and by the lack of training on how to articulate with the symbols of language. This failure to obtain verbal responses is often deplored by clinicians who, at times, find that this difficulty of expression hinders a fuller understanding of the subject or patient. In the finger-painting process, however, the subject has communicated on another level—preverbal or extraverbal—through his behavior and activity and his symbols.

As he extensionalizes his thoughts through this medium and receives no adverse criticism, leading questions, suggestions or interference from the administrator he will break into the use of words in order to make clearer his meanings and needs to the administrator. He will, perhaps timidly at first, give short phrases to insure that the administrator understands his meanings. The vocabulary may be inadequate; the clarity of his words may be distorted; and his technique may be poor, yet, because he has no sense of guilt about his extensionalization—finger-painting—he will communicate, even if it is no more than a beginning. At times, even that is difficult.

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[9] Ruth Faison Shaw.

The administrator must approach the person from the point of view of the subject's inadequacy in the technique of verbal expression. In this situation, the administrator utilizes certain principles of teaching, namely: that he be so interested in the subject that timidity is overcome through the establishment of rapport; that clarity of meaning is sought by both individuals; that through new experiences the individual's vocabulary is increased. This process involves primarily the processes found in good teaching through the establishment of rapport and interest in the patient. The patient should feel comfortable in using whatever words he has in associating his experiences with the painting. If the administrator's clarity of meaning is such that his words are well chosen and that there would be no doubt as to the exact meaning of the words used, then the subject's vocabulary would increase with new experiences.

Verbalization in finger-painting might happen at any time during the process. It may be a running commentary during the process or it may be in the form of ejaculations of pleasure, displeasure, disgust, inadequacy, or boastfulness. Often a terse title is given to a finished picture before it is set aside to dry. The flow of words come with some when their hands are in the bucket and not necessarily while looking at the picture. During the cleaning-up period patients often discuss the processes rather than the content of their painting.

As the picture is spread out on the board to dry the administrator can often get a full story through his critical appreciation, approbation, and wonder of the picture. The title may be reiterated at this point. This is the opportune time for the administrator with pencil in hand to encourage a fuller explanation with such remarks as: "Go on," "Tell me more about it," "And then" . . . etc. Leading or direct questions should be avoided because of their suggestive nature, for they often block or misdirect the initial spontaneity of the subject's trend. An interesting experiment is to get a story about the same picure at a later date, and to note the difference in interpretation and the emphasis on certain symbols by the subject. These different and later responses seem to be a more conscious effort of the subject to please the administrator with many more superfluous adjectives and free associations of ideas. These seem to have little to do with the first important spontaneous responses. These later responses often lack the emotional ideas which were a rhythmic counterpart of the muscular movements of the first finger-paint.

The first story may be a climax to the mood of exaltation which accompanies the creation of the painting and the pleasure to the response of the administrator. It is necessary for the administrator to use his resources to get a verbal response, because as progress is made in levels of development, language becomes more and more a necessary means of communication. Until the subject talks words, the administrator must accept this silent preverbal communication whose meaning lies only within the performance. He must also accept the preverbal movement accompanied by sound which have definite description of meaning of those movements. He must also accept the extraverbal sounds which may resemble words. He may have doubt as to their meaning, but there is no doubt of the meanings as used by the subject. These meanings could be confirmed through other clues especially if he uses those self same sounds in imitation which gives pleasure to the subjects. Through adroit handling of these sounds plus the use of legitimate words it becomes a simple task to make the transference to legitimate words describing legitimate experiences. Then verbalization becomes easy.

With some there is necessity for curtailing, rather than encouraging verbalization, as with the loquacious, chattering person seeking too much attention. These will babble on without thought, or logical conclusion, or without contributing to the summing up of their personality. At the other extreme is the individual who at the beginning gives no verbal response, and is conditioned to question and answer conversation only. This pattern, once recognized, should be continued until such confidence is gained that it will be easy and without emotional reaction to unlearn this condition and accept and attempt the mode for fluent, spontaneous, and creative articulation.

Another silent type is the person who volunteers such remark as "I don't know what it is." He really does not know. He has been subjected to such over-bearing conditions as dogmatic parental authority or erratic training that he manifests strong defeatism based on a lack of understanding relationships between his conscious behavior and his repressions.

There is another silent type who is so overcome by the guilt within himself and by the fear of being found out, that he is silent at what he sees in the picture, and then deliberately constructs a fictional common-place story which he hopes will deceive the administrator. Although, in reality, it is a verbal response, it is considered a silent one because it is a deliberate attempt to hide the truth and the emotional reaction to that truth.

Given the opportunity a particular group of children will express their stories in short, terse phrases having the form of blank verse. These "poem titles" such as "Five notes of music floating over the hills" (Mary, age 6) shows exquisite beauty in thoughts and words, but their conception was in their childhood experiences which may have been of a terrifying or belligerent or claustrophobic nature.

There are other types who display variations in verbalization but a great number of these fall in the category of those who have not exercised their ability or lack of ability in the creative process. Their verbalization is as commonplace as is their picture. *Never forget potentialities and possibilities of greater achievement may lie buried in these more or less colorless creators.*

Verbalization may take the form of one or combination of many types of stories or explanations. Among them are: fantasy, fiction, fact, imagination, humor, absurdity, description, primitive, mythological, cultural, etc. All of these stories or explanations are symbolic in their meaning insofar as they project mental mechanisms reflecting their actual conditions. At the same time they may also reveal their adjustive attempts to cope with or to justify their existing condition.

The symbolic content of verbalization gives clues to the dynamic mechanisms, i.e., identification, projection, rationalization, sublimation, etc. They also give clues to the emotional state or condition of the subject, such as conflict, wish-fulfillment, fear, repression, anxiety, defeatism, etc.

The process of finger-painting accompanied with its opportunity for verbalization enhances the interpretation of the personality and gives a more accurate appraisal of the subject's behavior mechanisms.

J. THE SERIES

It has been found that a more accurate picture of the individual's total behavior pattern can be elicited if more than one painting is done. At times, there arises a situation where the dynamisms at work may be suggested but not included in the same painting, and the need for confirmation is necessary through additional paintings. At such times, it is recommended that other paintings be given for confirmation of this questionable performance. At other times, though a personality pattern is confirmed, other paintings are necessary to make a differential diagnosis. Further, a series may be indicated when the subject "cannot tell all" during one session. This may be due to a domination of distracting associations, or a fixation as a result of the finger-painting stimulus, or his emotional set may be so erratic that it in-influences the natural and logical sequence of associations which produce the projection. Still further, the subject, at times, because of a sense of guilt "rubs out" his productions so rapidly that it escapes even the discriminating observation of the administrator. This is especially so when the subject fails to verbalize about these "rubbed out" productions.

Finally and perhaps most significant, the series is justified, because the clinician must be constantly aware that these so-called "personality tests" are being applied to *human beings*. As such, the writer believes that the "experts" have been too free and too heedless in describing the behavior of human beings on the basis of one "test" be it of a few moments or of a few hours duration. Added to the fact that these findings are applied to a vague entity, i.e., personality, which is not completely understood, the error of diagnosis may be multiplied perhaps more times than has really been imagined. Therefore, describing personality as a state of being "at a given time," a series of tests is indicated for a more adequate sampling and verification of the clues as a definite part of the personality pattern. This is highly important in a differential diagnosis especially when the subject has very recently experienced emotional trauma. Then it becomes significant in the diagnosis whether this maladjustment is transient or permanent. The prognosis and therapy indicated depend in great part in making this differentiation as accurate as possible.

A demonstration such as is given for the first painting is rarely needed for paintings that follow. Only in such cases where memory is impaired; or where there is so much antagonism or defiance (i.e., a patient confined to a straight jacket between the time intervals of two paintings) has it been necessary to repeat the initial demonstration.

There is a group which asks for directions after the first painting, but who suddenly recall the detail procedure when an attempt is made to re-demonstrate. These often make an error of omitting name, date, or other single item of procedure.

There is another group made up of individuals, who although no demonstration need be given, feel there is a certain responsibility for self-reliance for which they are held accountable. These follow through the procedure only while the administrator observes their actions.

Observations of cases have shown that subjects follow a definite pattern of procedure during the series. The first painting is a pleasurable exploratory experience. This first painting often leaves some individuals so highly stimulated that they show a reluctancy to do a second one even though they return to do so.

During the second painting patients often show their emotional reaction in terms of guilt to the first painting. This guilt feeling is based on their thought of "telling too much," or show discrepancy in skill, or feeling frustrated by their inability to create at that time.

During the third painting session the subject often reviews any discussion which was had during the previous painting period. This usually occurs before he begins to paint his picture. During this third painting the patient usually expends much conscious effort, but is not satisfied with his creative production. However, this painting reveals more of the personality in action than have the previous two.

During the fourth painting session the effort is not as deliberate, but is more indicative of the painter's common personality trends. The habits of procedure have now been established and skill has been developed by the subject. Normal subjects do not, as a rule, paint a series of pictures in the clinic set-up. With the clinic patient, habits are so formed at the time of the fourth painting that all signs of reluctance have disappeared and this picture becomes significant in revealing the more deeply-seated factors of the personality.

Of course, one must realize that variables occur depending upon the rhythm of the individual. For example, the fifth picture of the male rhythm may be as significant as the fourth picture of the female rhythm.

Those individuals who naturally comprehend mathematical order and logical procedure will spend a longer time at their creation. Their interest is stimulated because of their absorption in the process and their desire to improve in skill. As their development continues articulation is more facile and their representations are more skillfully portrayed, though not necessarily more artistic or beautiful.

On the other hand, the individual working on the emotional more than the rational level because of the pleasant response of the skin to the paints and water, the condition of freedom, and because of the rapport between himself and the administrator, often does his first picture unusually well. This may be followed by a picture not well done. However, given opportunity to develop skill, a gradual improvement in technique can be seen throughout the series until the subject's peak creation is reached, again and again.

The individual while discovering his skill ability may be prompted to ask the administrator for aid, e.g., "How do you make a tree?" Although it is permissible for the administrator to aid in this skill development, this aid should be in the form of verbal suggestion with gestures stimulating imagination and following the line of natural direction of the thing to be represented. As previously stated, the administrator is never to paint for the individual, nor even to touch the patient's paper.

In the succeeding pictures (after the fourth painting) one begins to find a detailed but slow unfolding of mental mechanisms revealing basic attitudes and influences of earlier experiences pertinent to the patient's personality maladjustment. To obtain these etiological foundations, especially with severe cases, it has been found that less than eight sessions of finger-painting is not conducive to an adequate study of the total personality.

Of course, an individual may do more than one painting at any session. He may wish to destroy a "failure," but because more often than not, this painting is more significant than one he does well; it should, therefore, not be discarded—rather—it should be numbered in sequence and placed in his folder.

Although a minimum number of eight paintings is necessary for a given series to be reliable in the confirmation of a diagnosis, no specific maximum number can be stated. This can only be judged by the number of times the individual repeats the same picture. The writer recalls the case of a boy who in his finger-paintings "killed" his father 27 times in a series of 27 different pictures, but all having the same theme. This theme was so predominant in the child's life that it was necessary to repeat the "killings" many times before he could reveal other personality factors.

Through careful observation and recording of results it has been found that twice a week is a good finger-painting dosage for optimum results. In this way the subject is not fatigued by frequency of repetition nor is his interest lost by too long an interval between painting sessions.

With school children and those individuals who are or have been influenced by a school pattern of time—it has been found that Tuesdays and Fridays are the most favorable days for finger-painting.

The time element for the series is the same as for the first session discounting the demonstration period.

The writer well recognizes that one of the disadvantages of any projective technique is the time consuming element. However, because of the very nature of projective methods this time element is necessary. Group finger-painting is possible because of the time-saving element when dealing with large numbers. It is also strongly advisable since man is a social being *as well as an individual. He reacts differently at times in a group situation.*

Through experience with finger-painting it has been found that a group of six to eight members constitutes the greatest number with which adequate work can be done in personality studies if carried out by an expert in this technique. Larger numbers may be used when finger-painting is used only for recreational purposes.

The advantages of group painting are many. It inspires competition, and stimulation by comparison and comments by others in the group. There may be the tendency of the less skillful and less creative individuals to copy a more dominant individual. This should not be distressing since they are revealing their dependence upon others. With proper teaching they can be led out of this imitative process. Further, many movements and aspects of behavior become freer in a group situation since the administrator is more obscure. However, the administrator although obscure, is alert in his discriminate observations.

This chapter dealing with finger-painting in a series is probably discouraging to the clinician when he realizes that eight sessions occurring twice weekly making for one month's time are necessary to appraise (with confirmation) personality with this technique.. It is hoped that he realizes, too, the many and often frugal attempts over a much longer period of time necessary to discover etiological causes and dynamisms of behavior. Very often months in out-patient mental hygiene clinics and years in mental institutions are spent for this very same purpose. Also, more often "impression" and "prognosis" is given rather than "diagnosis" and "treatment indicated." To those who are more direct than sympathetic in their approach, the therapeutic aspects of this procedure should well compensate for this longer exploration time, which is often necessary for complete and more accurate diagnosis. The clinician should remember, too, that the first picture usually gives sufficient significant clues to make for the ideal situation of diagnosis and therapy as a mutually reciprocal process.

VI. OBSERVATION DURING THE FINGER-PAINTING PROCESS

As important as the finger-painting process itself is the observation of the *physical aspects of the subject in action. It is only with this performance* background, which is orienting as well as revealing, should the administrator analyze the painting in his attempts to appraise the personality of the painter.

It is of paramount importance to state here that personality appraisal should only be attempted when the findings of the three main aspects of the finger-painting technique are given, namely, the behavior performance, the finger-painting, and the verbalization. It would neither be true nor just to the patient or to the examiner, or to both, to do otherwise.

The observations to be made by the examiner include the idiosyncrasies, actions, and reactions of the individual during the finger-painting performance from the beginning to the end of the procedure.

A. The Beginning

The observation begins with the reaction of the patient during the administrator's demonstration. Among the observations at this time the administrator notes the following: whether the patient shows interest; whether he shows pleasure, displeasure, indifference, or horror when he sees the administrator plunge barehanded into the paint; whether he overcomes this horror with eagerness to place his own hands into the paint; whether he gives attention *with eagerness or repugnance;* whether this attention is concentrated or distracted; whether he tends to interfere or is a good listener; whether he shows *admiration for the painting or for the one who is doing the painting; whether he is patient in waiting for his turn to paint;* whether *he is eager or reluctant to paint.* These *considerations are only a few of* the observations one should gather on meeting the patient.

This pre-performance observation gives orientation to the administrator as to what he may expect in behavior—but not in painting—from the patient. This preview of behavior serves to allow the examiner to formulate tentatively his plan of observation, fitting it in with the general situation, thereby making for continued rapport relationships.

B. Immediate Preparation

One is concerned here with the observation of whether the subject feels his paper to ascertain which side is glazed (to use as the painting surface) and which side is flat (on which to write his name and date). Also of concern here is whether the subject is willing to write his name identifying his own painting. The individual may be too young or too reluctant to write his name and the date. The young may make a mark with a chosen pencil or crayon. The reluctant child or adult will use many devices to avoid signing his name. This may signify ignorance of the joy of possession, denial of one's own work, or defiance of instruction, direction, and/or order. Identification in finger-painting is further significant since many either deny the painting not realizing their own creative abilities, or refuse to admit their projections or inadequacies. At this time the first evidence of handedness is found. It is further significant for the administrator to have these data for the case record history.

C. Wetting the Paper

The wetting of the paper is the most difficult operation of the activity because people are not accustomed to wetting large sheets of paper. They are afraid of spilling the water or tearing the paper. Because of this apparent fear or lack of experience, the operation of pulling the paper through the water, tilting it over the pan to draw off surplus water seems to be more difficult for the average adult than for the average child to do successfully. This apparent fear and lack of experience is carried over when the patient tries to place the paper in such a way as to remove air bubbles and wrinkles. It is here that most adults do not follow the instructions given and attempt to remove wrinkles by their own method, with assumed confidence in their own ability. It is here too, that the administrator permits himself to help the patient overcome this physical difficulty. This, at the time, indicates the physical inadequacy and lack of ingenuity in other life activities as well as non-conformance to standard rules and suggestions.

D. Posture

Inasmuch as this activity incorporates the whole individual, his body stance becomes a significant factor in the total appraisal. In considering finger-painting as an activity of the whole individual—integrated—one cannot deny the physical aspects. Evidence gathered in finger-painting shows that the disturbed person often demonstrates physical manifestations compatible with his disturbances. Yet, it may merely reflect a poor habit of posture only. The pattern being set by the administrator's demonstration of good posture, the patient begins in this pattern and he is watched for change. If change in posture occurs, and it usually does, the administrator suggests correction. This corrected posture will seldom be maintained in the beginning.

It has been observed that the individual will repeat certain habitual behavior in his posture. Some individuals lean heavily on one hand while painting with the other. Others lean against the work table with their abdomen getting paint over their clothes. The adult reluctant to get paint on his clothes by leaning on the table, avoids this obvious posture—yet by the time he finishes his painting, he too will have paint on his clothing. With both groups there appears to be a great sense of guilt in getting paint on their clothes but no guilt about leaning. This becomes significant in both diagnosis and therapy because it reveals that though they refuse to recognize the cause, they appear distressed by the results.

There are others, both adults and children, who, while painting, continuously shift their balance from one foot to the other thus distorting the pelvic axis. They may also wrap one leg around the other. In the painting they show compensatory behavior by scratching the paper and slapping the paint. They often add too much water or take too much paint. Their pictures show confusion, and lack of balance; the content is generally violent in nature. This aggressive behavior is accompanied by verbal and pictorial inarticulation especially at the beginning.

In situations where the individual may be depressed or lacking in motivation, physical motion is slow and undirected. Sensations seem to be only in the skin. Often there is shock in the realization that paint is on his clothes and the reaction is a rigid body and smelling of the hands. Often while smelling the hands the subject will get paint on his face. Then he may paint again with interest but very shortly after, this same behavior is repeated.

It is interesting to note here that the normally secure child and the feebleminded individual with good rapport, often sustain good posture and show rhythm, form, and balance. Naturally there are wide differences in content.

These are some of the observations among many which show how postural clues become meaningful in the understanding of personality.

E. MANNER OF APPROACH

With respect to approach one of the main interests of the administrator is to ascertain how much of the demonstration the patient visually recalls and can carry through. After the paper has been prepared the administrator should notice the length of time taken for color preference (whether the color is directly chosen or hesitatingly so), the color chosen, and the amount taken on the spatula.

It has been observed that the individual who hesitates while choosing his color either has been disturbed by an immediate experience or is simply in a state of indecision as to color choice.

The administrator in his demonstration has already given the patient a suggested quantity of paint to use. This verbally expressed quantity is so flexible that often the patient by selecting the amount for use reveals likes or dislikes for the things with which he associates the color. This attitude at times may cause him to change his choice of color as well as the amount he takes. Further observation includes whether he remembers to return his container of paint to its selected place. This very simple act often gives insight into obedience, orderliness, and social consideration.

At the completion of the demonstration, one will have noted, that indifference in the patient is seldom encountered during the finger-painting process. He is either definitely eager or definitely reluctant to paint.

The eager one usually knows exactly what he wants to do. This, in terms of diagnosis tells the examiner much of what to look for and, in many ways, what to expect. In most cases where "When will I paint?" is asked, the attempt is made but rarely completed because of the interference of an anxiety state with the active stream of consciousness.

This lack of accomplishment is revealing because it indicates the subject unknowingly leaves the world of reality and begins the projections of his inner psychic life which reflects his personality patterns, attitudes, desires, conflicts, etc. At this point the administrator should refrain from all interruptions particularly those of an associative nature.

The reluctant subject may have such varied excuses as "I haven't time to do it today," or "I don't know what to do," or "I can't draw," or "I don't want to do it," or "I don't like to get my hands dirty," or a more remote reason. All these responses have been made by adults as well as children. The administrator must take care to meet these objections in such a way as he feels will reach the subject. However, some subjects will be rather defiant in their objections. Their remarks really mean, "I won't do it."

F. Position of Attack

By the subject's position of attack is meant how he places the paper; on what part of the paper he places his first daub of paint; which hand he uses first; with which part of the hand he starts to work; the line of direction of the movements; the timing with which he adds water; the extent of the surface he covers automatically; and, his tendency to paint a partial or all-over pattern.

There are two accepted positions in which to place the paper on the water-proof surface after it is wet, namely, horizontally or vertically. Those who paint in "mud," "in the sea," or "on the earth's surface" will place the paper in a horizontal manner and break up their scenes with trees. As creative skill develops (indirectly shown in finger-painting through muscular coördination together with a more urgent desire to express) the subject tends to place his paper in a vertical position. In general, the majority of subjects place the paper in a horizontal position.

Where a subject places the first daub of paint is a clue to what may be expected of him later on. Using Figure 4 to facilitate explanation it has been found that subjects placing their first daub of paint in area *C* are of the highest development in rhythm, repetition, and points of interest. Area *B* is indicative of a personality less developed in skill and articulation. The person who meticulously uses area *D* appears to be extremely timid and, conversely speaking, egotistical. Others may paint in area *A* going off the paper. Although the statements just made would appear to be dogmatic, and some may disagree with these findings, the fact remains that these observations have been repeatedly made in the course of the administration of hundreds of cases and are borne out by these case records of those who painted.

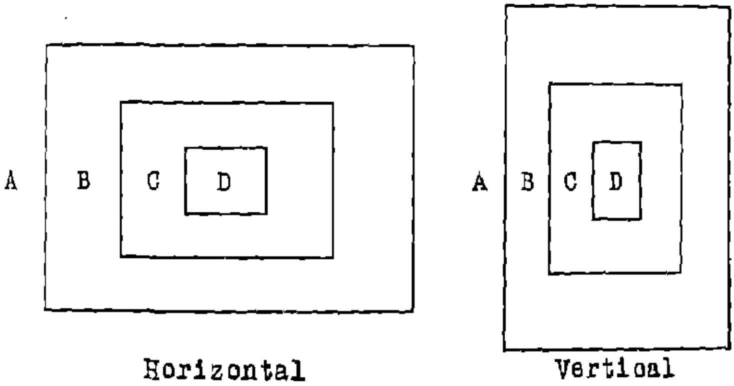

FIGURE 4
HOW THE PAPER IS PLACED AND THE LOCATION IN WHICH DIFFERENT SUBJECTS PAINT

The reader must not overlook that these observations and their implications hold true only during the initial warming up process before any water is added. What holds true during this initial observation period may not be true during the painting of the picture since many of the movements after the addition of water, are natural, normal, and necessary to get the desired effect while painting.

The subject now undertakes the completion of his own cycle of projection and many of the motions made during the painting are his attempts to discover how he can project his desired effects during the creative process. The more powerful and able the creative urge the more resourceful, realistic, and symbolic the painting becomes.

G. The Starting Hand

Right handed individuals always use their right hand with which to start. The true left handed subject will use his left hand. The re-educated left hander often uses his right hand as a substitute for his left hand as indicated by his left handed movements with his right hand. Most children use both hands without hesitation. Adults using both hands may be found too but invariably they ask permission to use both hands.

H. Parts of the Hand Used

The persons who follow directions and instructions will adhere to the more wholesome patterns of behavior. These use the whole hand, palm and finger, throwing weight on it, work up the paint smoothly, and paint quickly and with pleasure. Some approach it with apparent disgust and use nothing more than their finger tips and this in a hesitant manner. Often, in addition they verbally protest against the material. The latter have difficulty in working their paint and usually accomplish little until their attitudes change. Other subjects use the palms of their hands but with fingers turned up. Still others cup their hands and use the lateral aspect of the hand to paint. Some use fingers only. These usually pick at the paint and play with it in a teasing manner. Others, in a minority, use their arm to work up the paint. If both hands are used simultaneously then similar actions are performed by each hand. This performance of using both hands does not last long. Later in the process of painting, the thumb and heel of the hand are infrequently used.

In spite of the fact that the administrator has carefully demonstrated the importance of rubbing the paint smooth many subjects do not do so without further prompting. These are inclined to add water too soon.

I. Line of Direction of Movements

The majority of people direct their movements from the bottom of the paper in upward sweeps using outward circular motions. Either or both hands are used. This is considered natural motion. In the up and down movements some accentuate the up stroke. If there is horizontal movement the dominant hand usually leads the way. However, in the painting of the picture the creative urge is so great that the subject adapts his muscular movement to his intellectual comprehension of the line of direction of the thing he is representing, i.e., trees and grass naturally grow up, fish may swim down. There are many variations of the circle and straight line movement.

J. Timing With Which Water Is Added

The paint should be well and smoothly rubbed before water is added. This cardinal rule in the directions is disregarded by many adults and by children. Some children will add much water and often. Others seem to prefer to work with dry paint for a longer period of time. These observations should be recorded during this phase of the process since they will be significant in the appraisal which will follow.

K. Extent of Surface Covered Automatically

Most children cover the entire surface of their paper as directed, because children are usually coöperative, desirous of pleasing others, amenable, obedient, wishing to excell, etc. Children also excell in this respect since they display great pleasure in carefully covering the entire paper. Adults cover the paper as a matter of following directions and show no display of enthusiasm as do the children. Some slyly leave parts uncovered while others defiantly refuse to cover the entire paper surface. In like manner they refuse to smooth out the paint, leaving blobs and lumps of it. The degree to which they manifest this antagonism may be confirmed later by their choice of color, their too free or sparse use of water and by their general direction of attack.

L. Partial or All-Over Pattern

It is observed that people who are muscularly well coördinated and rhythmic enjoy painting repeated all-over patterns. There are some who have a short activity span time and will show this by repeating a movement a few times only. These movements are made in about the center of the paper, whereas the opposite trend is to carry the pattern from one side of the paper to the other. There are still others who cannot carry a movement across the paper because of emotional factors.

The very young have not the physical length of arm to carry across the width of the paper. Similarly, some adults who have length of arm, follow the same pattern of performance as these young children. Those children who are free enough often cover the paper by stretching; this compensates for their short arms.

Of special interest is another group who are so pleased with the automatic muscular rhythms as shown in their all-over patterns, that the creative impulse is subordinated so that they create a design instead of painting pictures or verbalizing. In the majority of cases, however, the all-over patterns are preliminary exercises in which are discovered associative experiences.

M. ORDER

Order is of concern from a functional point of view during the activity period. The well-adjusted individual will try at first to discover what effects, through pressure and speeds, can be had from the uses of the various parts of the hands and arms. In the discovery of effects achieved through the use of any part of the hand with which the subject is working, an association is made between the impression felt and some past experience (or the reaction to that experience). With this as a central theme, he proceeds to develop and to paint around it the necessary environmental trimmings.

More rarely, in this group, there are some who swing the circle in continuous progressions which resemble the figure eight, starting at the top of the page and coming down. These swings may be voluptuously round, or elongated *S* or angular in appearance. For this group, it can be predicted that they will be very resourceful and will gather all their experiences and, unaided, will extensionalize themselves by showing also good color, harmony, form, balance, and rhythm. Perspective likewise will be evident and there will be a tendency to paint details in the immediate foreground. Moreover, the painting will show completeness. After due contemplation the patient may wish to rub out the painting and do another one; but if he does it will be with the satisfaction of achievement. This portrays a normal, wholesome situation. Verbalization, too, in this group is natural and unrepressed.

There is another type who have learned art representation either because they have been more observant or more practiced. These show greater control in representing objects through form and not through motion. Unconsciously, they represent perspective in a marked degree by making the "far away things first and relatively smaller," then in scale and by degree approach the nearer things which are made "last and relatively bigger." This group shows achievement through creation of mass rather than form. Abnormal trends in this group are indicated by the opposing tendency to make far away things not always first and not always smaller. Close-up things are made first and are destroyed as distant objects are made later.

Another group diametrically opposed to the first group make circular movements, but in a disorganized and smeared manner with very inconsistent non-repetitious movements. This group is unskilled in portraying form or content. However, by free association, they build pictures around some disorganized and sometimes disguised forms. From observation it has been noted that many in this group will draw with their fingers because they have been conditioned to pencil training or because they withdraw the hand from the paint and use their fingers for detail drawing in the painting —the fingers representing the least possible contact with the paint.

N. NEATNESS

A hand-maiden of order is the manner in which it is carried out, namely, neatness. Order may be considered a manifestation of mental processes. Lack of neatness may be considered bad motor coördination in trying to achieve order. Neatness should be acquired as opposed to sloppiness and messiness with the water and paint. It is interesting to note, however, that some neat prim people who resent exceedingly "getting their hands messy" are particularly disorderly in procedure. In their finger-painting experience these people often gainsay their reputation for neatness by refusing to "clean up" or "wash their hands and arms carefully."

In finger-painting, where there is lack of neatness there is also bad coördination. This may be associated with the lack of appreciation which goes with a well finished job. Absorption in finger-painting may lead to a disregard of the social amenities. Awareness of this carelessness leads to self correction.

There is still another group of persons who do not follow order through to its completion and manifest great sloppiness in cleaning up or actually refuse to clean up. These people have not experienced the satisfaction of "finishing the job." These people constitute a majority. Is it because of bad or limited training? Finishing the job is part of the order of procedure and as such the administrator should insist on its completion. This is not interference on the part of the administrator. When this aspect is brought to the attention of the individual in the proper manner it gives him a chance to improve. This is therapy in action.

O. THE PERFORMANCE CYCLE

The individual's performance cycle in finger-painting depends upon his interest, his absorption and skill, and his period of activity.

By interest is meant the attention of the individual to the administrator's demonstration, his avidity to do it himself, his absorption in his own performance, and his reaction to the administrator's apparent evaluation of his performance.

The administrator while demonstrating has the task of motivating the individual's interest through a skillful presentation of the technique. This means handling the materials effectively accompanied by verbalization in narrative form in a pleasant and exciting tone of voice. No matter how simple or juvenile the theme may be, if well done it is adequate for presentation to the individual or group regardless of age or sex. The adaptability of the administrator is demonstrated by the choice of the topic of his narrative according to the appreciation of the age level of the subjects. The administrator should be so well versed in the manipulation of this material that he shows no anxiety or fear, so that he may not cause himself to be rejected by the patients. It is best, especially in group situations, to have a few moments of social introduction and chatter for rapport building. By letting names be known and by his own friendly manner he develops sympathy for himself and for his performance. In this setting the patient is usually eager to participate in finger-painting.

Some individuals simultaneously exhibit a desire and reluctancy to paint. Skill on the administrator's part is necessary to overcome this hesitancy. At times the administrator must go so far as to start the patient by marking and wetting the paper for him. In rare instances individuals have bluntly refused to paint, probably because of fear. This no doubt can be said of any test, questionnaire, or technique. The skillful administrator with persistence and proper stimulation can be successful in getting this type of individual to paint.

Since there are as many reactions as there are individuals, only a few observations need to be recorded to give the reader an idea of what to look for in the individual's interest in his own performance. An eager but badly coördinated individual, often spills water, uses too much paint, and is impatient to achieve the right consistency of paint. He will hinder the whole process by adding water too often. He usually is so impatient that he splashes the poorly smoothed paint all over the paper, table and even the floor. He may say, "I don't know what to do," "Show me," "Tell me again." He may want more paint and use color after color. He usually does not notice that the mixing of too many colors give a "mud color." Unless he gets more paint and water he seems dissatisfied and continues to ask how to do everything. On the other hand some children will take too small a quantity of paint. They often say they want "light blue" or "pink" which means a small quantity. They work the paint very thoroughly and wash their hands often. They spend a long time in cleaning the table and washing the rags, inordinately prolonging the session. In doing a second picture these individuals often choose black or brown as the color.

Another group of subjects repeatedly ask for new paper and new paint. They make no representation through form and seem to be pleased only with skin perceptions. However, they need only a suggestion to change their line of direction. Some children have short activity interests (less than half the average time) and usually stop with an excuse such as "I have to go now." When called back to finish their job they show irritation and slovenliness in their poor attempt at cleaning up. Other children paint over the average time and their question usually is "When can I come back?" These children often keep their backs toward the administrator while painting. However, the pleasure of the performance and the privileged freedom allowed by the administrator makes them want to return for more.

Similar performances are being encountered repeatedly while working with service men as patients in Army and Navy hospitals. These men, particularly chair-ridden and bed-ridden patients, who have experienced military discipline and some active duty, react much in the same manner. The ambulatory convalescents will turn their backs to the administrator while working. The sedentary patients will stop painting and dilly-dally while the administrator is observing them. They will resume painting when the administrator walks away or if a buddy of their's approaches the scene.

The administrator can always find some part of the patient's attitude or effort sufficiently meritorious to compliment him sincerely. This is of paramount importance to each painter, although a few assume a pose of doubt toward the administrator's sincerity. In spite of this doubting attitude the painter nevertheless is seeking approval for his performance. The administrator gave, at the beginning, an example of story-telling during his demonstration. Now he has the opportunity of admiring the work of the patient. This leads to the next step: verbalization. If necessary, encouragement toward articulation may be fostered through such remarks as "Let us give the picture a title." The title may be given freely. The administrator can agree that it is a good title and that it has the possibilities of a good story. The patient may respond with a few sentences, a lengthy tale, or not at all. In any case there is a projection of the individual's articulation.

The period of activity of an individual's painting is from 30 to 40 minutes. The complete administration including introduction, demonstration, patient participation, cleaning up, and verbalization approximates an hour.

P. SATISFACTION OR DISPLEASURE AT END

The satisfaction a person has is often shown by his anxiety to have the administrator's approval of his painting. He says—"Come look at this" and points out many things in the painting he likes and wishes the administrator to comment upon. He awaits criticism and appreciates it. His desire is (sometimes exaggerated) for the administrator to talk about his picture and discuss it and ask questions about it. A word of caution on how the administrator words the criticism is very important. Don't praise the picture unless there is real merit. Fortunately, however, there are always some parts or details about the picture which the administrator can sincerely praise. It is interesting to note how often the person painting demands favorable criticism seemingly of his picture but in reality of himself. His eagerness is a cue to get him to talk about himself. This is an excellent opportunity to encourage verbalization. At this point one can astutely get him to describe what his feelings were and are—as extensionalized in his painting. He will describe himself by talking about the picture which is his projection and do this without a sense of guilt. Supposedly he is not talking about himself but about the "ogre in the picture who kills." Therapeutically it is of inestimable value to anaesthetize his guilt feeling by allowing him to describe the picture. It has been found that in a long series of paintings this guilt dilutes itself through carthársis. The writer recalls the painting of a little boy, aged seven, a non-reader type, who for weeks drowned all small adults of his acquaintance, drowned his mother and finally drowned his father in all his pictures. His story was commented upon as being "a made up story like men writing books." A week after the drowning of his father he made the same kind of picture but when asked whom he drowned today he changed the theme of the story and said, "I don't have to drown anyone now that I am a man. I did that when I was a little boy."

The therapeutic aspect is brought in at this point to emphasize the importance of continuous diagnosis while therapy is in progress. It is important to know the patient in his various changing forms so that therapy may always conform to the patient's mood, thereby achieving the same goal with less blocking and resistance. In order to reach a goal in therapy the diagnosis should be continuous and not fixed at the end of the first examination. This must be admitted if it is agreed upon that personality is the sum total of one's experiences and his persistent tendencies to make certain kinds of adjustments as a result of these experiences at a given time.

We are today, because of yesterday; and what we are today gives promise to what we will be tomorrow. Accepting this premise of prognostication, the intelligent diagnostician realizes the value of repeated diagnosis in revealing changing paths of outlets and obstacles within the patient's behavior pattern. In this manner the diagnostician can find out about the personality and be better able to understand intelligently the individual with whom he is working. Although this may at present sound more theoretical than actual—its shortcomings are due to our lack of knowledge of personality, behavior, and the lack of ability to understand the patient's symptoms through his non-verbal performance. If the patient is proud of his picture, he wants to keep the picture; carefully puts it away; and returns to admire it. This pleasurable characteristic of possession is shown by the service man who, knowing he has no place to keep the painting, and knowing that he may not be able to return, generally requests that it be sent to *some woman, usually to his mother, much less frequently to his* wife, and rarely to his fiancee or best girl. Thus far, in almost a thousand of such cases, only 11 wished their pictures to be sent to men. Of these 11, two went to fathers who had been the only security they had known—the mother being deceased since their infancy; two went to former male art teachers; three were sent to some individual of the dependent institution they once were brought up in; the remaining four were sent to homosexuals. A patient's displeasure is often shown by the rubbing out of his productions immediately and by leaving the work table. He may say he doesn't like the feel of the paint or of a color. Afterwards he may attempt to paint again and because of suggestions of the administrator to choose another color. *In certain cases where the association of the feel of the paint* is disagreeable because of some experience in the past (usually associated with brown, and sometimes with black or red), it is further suggested that the administrator who is aware of the interpretation in the picture create pleasurable association to encourage the painter. For example, he might associate brown with chocolate pudding or ice cream; black with licorice; and red with evening dresses, robes of cardinals, or red flowers. Peculiarly these associations have nothing to do with feeling yet they substitute a pleasurable experience for the patient's unpleasant non-verbalized reaction.

This displeasure is further shown when the patient later denies having painted the picture because "It's too beautiful—I couldn't have done that" —or it reveals too much of their guilt, *believing that the* administrator knows as much about them as they themselves do—or they disown the picture and that, in toto. Some often show displeasure by tearing or rumpling the picture, or by carefully folding the picture and leaving it on the table, or by washing the paint off the picture. At times, the patient will prolong the performance and postpone his projections, both pictorial and oral.

Q. RELAXED OR STIMULATED

When a subject completes his finger-painting activity the function of the administrator as an active agent in the performance recommences. This activity is in the form of admiration or appreciation, and interest in the complete picture or in any part of the picture over which the administrator can be sincere in his comments and attitude.

If there is over-stimulation as in the case of the young child who begins to slap the paint, to spill the water, to become very sloppy, etc., then the administrator very carefully shortens the time of the child's participation. Over-stimulation in the adult is often expressed by "I don't know what to do," "'I can't do it like you do it," or "I'll never do it like you do it." There is another group who when over-stimulated begin to talk loudly, usually boasting of their achievement in painting. Usually they refuse to finish their job, i.e., clean-up. However, when there is this over-stimulation, it is wise to lead them into other fields of thought or action.

The over-relaxed person usually doesn't clean up either, and complains of not liking to work with the material—although continuing to do so. He may yawn during the process and choose some excuse for leaving very shortly such as "I have to go now" and is often easily irritated.

At times the over-relaxed person really is suffering from boredom and fatigue. This may not always be an unhappy situation for the patient. The writer recalls the case of a soldier suffering from insomnia who became so relaxed while painting that he put his head on his folded arms and fell asleep on the paper. Much to the delight of the therapist and amusement of his buddies he snored as well. Relaxation in some cases is so extreme as to produce physical manifestations such as burps, flatus, and drooling, which cause him to lose his social frame of reference at this time. Although observation is made of this reaction the session should be concluded as quickly as possible. At the same time the situation should not be made obvious because the subject is not aware of his actions. The session is ended without any discussion of the picture since the subject has already revealed sufficient diagnostic evidence.

The properly relaxed and stimulated person who is amenable to cleaning up is responsive to comments and motivation and eagerly draws out the administrator to encourage more comments.

R. VERBALIZATION WITH HANDS IN BUCKET

When the overstimulated, over-relaxed, and the stimulated-relaxed groups have developed a rapport situation with the administrator and the administrator with the subject then the development of a new condition arises in which the subject "thinks out loud." This condition is achieved through the techniques developed in the rapport building situation. The stimulus to think out-loud with the over-stimulated is the bucket of water in which he plunges his hands in preparation for the cleaning up process. While he is splashing the water on his hands and arms the administrator can lead him into verbalization.

The over-relaxed will quietly dip their hands in the water to clean up and often not completely wash off all the paint. They will play in the water a few minutes and not say anything. These usually verbalize when using a towel or rag to dry themselves.

The relaxed-stimulated group complete their jobs and usually return to the picture and with the right encouragement from the administrator will discuss the picture as they look at it. This opportunity to verbalize is usually in a more complete narrative form. At first, however, as with the others the verbalization will be limited to a few words while they grope for an appropriate title for their picture.

The chance to develop the technique of verbalization is present in those cases where finger-painting is given in a series. At first, verbalization is difficult because the subject has to make a transference of communication on a preverbal or non-verbal level, though pictorial to the verbal level. With the inarticulate this requires more time, hence the need for a series.

S. Cleaning Up

The over-stimulated is sloppy and does not like to clean up. He does not squeeze out his wash cloth. He does not wipe the table clean and often takes his cloth and tries to rub paint off his clothes. He shows poor judgement in this respect.

The over-relaxed pull their cloth out of the bucket unsqueezed and drippingly bring it to the table and in an appealingly helpless manner look for assistance.

T. Repeating the Performance

The over-stimulated and the over-relaxed groups desire to paint again and do a second picture during the same session. This repetition is conditioned by the success of the administrator in changing the subject's mood and trend of thought and then bringing him back to finger-painting indirectly. The opportunity to repeat should always be offered. The so-called normal person who has a sense of time and achievement doesn't usually accept this offer unless he is ambitious to paint a definite thing and he feels that time permits him to do so.

Some subjects attempt to paint as many pictures as time permits in their desire to improve past performances. Indifferent, passive personalities acquiesce verbally but do not accomplish anything—rather they "doodle" with the paint.

VII. ILLUSTRATIVE CASES AND THEIR DIAGNOSIS

On the basis of the foregoing context the writer is prepared to present a number of syndromes which show definite correlation between the findings as drawn from the Finger-Paintings done by the individual patients and the diagnostic accounts of psychiatrists in the institutions wherein the individuals were patients.

The use of Finger-Painting in recreational and occupational therapy programs have afforded those working with mental patients the opportunity to discover certain "clues" significant and often etiological to the patient's personality disorders. These clues have not been successfully organized and formulated for lack of standardization in administration and observation of significant phases of the process. However, in the process of administering many hundreds of individual finger-paintings certain definite observations of performances which are symptomatic of types of mental disorders have unfolded into specific syndromes characteristic of schizophrenic and paranoid personalities.

At the same time observations are forthcoming concerning other neurotic and psychotic behavior patterns as demonstrated through the Finger-Painting process. Until continued research accepts, re-enforces, or rejects the clues as reported elsewhere or found by the writer, definite interpretations of other personality disorders should be deferred.

The discussions and case illustrations which follow are presented because sufficient and reliable evidence has been gathered to enable one to describe a definite syndrome of symptoms characteristic of schizophrenia and paranoia. These case studies were made without any knowledge of their classification as diagnosed by the psychiatric personnel in charge. However, the findings of the experimenter were confirmed after the diagnosis was made through the Finger-Painting process. Such independent diagnosis indicates the contribution that the Finger-Painting technique can serve as a hand-maiden to assist the clinician in the identification and classification of disturbed personalities.

A. SCHIZOPHRENIA

The manner in which the schizoid personality pattern is portrayed in the Finger-Painting process is here described and illustrated. Certain of these symptoms are portrayed in a unique manner when the Finger-Painting technique is utilized for diagnosis.

The following is a typical Finger-Painting schizoid pattern. Two or more strata representations are invariably found in the production of such patients. (A "stratum" is a projection in a layer shape which extends from one edge of the paper to its opposite edge. This is clearly illustrated in Figure 6.) These strata are illogical, unrelated, disorganized, and incoherent. An interesting phenomenon relating to stratification (arrangement of strata) is the fact that with the very young and the very old these strata are presented along vertical axes. Those individuals whose age falls between these two groups invariably portray their strata along horizontal axes. The degree of deterioration is in proportion to the amount of composition and balance in the painting.

The verbalization used by the patient in explaining his painting follows the characteristic lines of the schizoid personality. Here, too, he is incoherent, illogical, disoriented, delusional, and lacking in reality as evidenced by the constant change of meaning and identification of the elements in his productions. Furthermore, whispering is present either during the process of painting or the verbalization.

The cases which follow illustrate in variation, that which has been described in the preceding paragraph.

1. *Case I*

The Patient is a wealthy widow who was a patient in a mental hospital in France for 20 years. She is 72 years old. Her family, living in America, sent a psychiatric nurse to bring her back to America at the suggestion of the French Government because of the approach of the German Army on Paris. This nurse is in constant attendance and brought the patient for a Finger-Painting session at the urgent demand of the patient and with the recommendation and consent of her personal physician.

For her age the woman is vigorous, much younger looking than her actual age, extraordinarily well dressed and bedecked with jewels. She appeared to act in a normal manner.

She waited for a very short demonstration, then asked to have her paper wetted and properly placed. The nurse wrote her name and the date for her at her command. All this was done because of her age. She asked for green and black paint. Turning to the administrator she explained that the green was for Paris and the black for America because "I'm both—I'm an American and I've lived in France—so I'll mix the colors."

She smoothed the paint easily, asking the nurse to sprinkle water on it at times. Then she made a futile attempt to represent the Eiffel Tower and the Empire State Building. This she rubbed out and became very absorbed in making this picture which she called "America and Paris." When finished she washed her hands and asked "What do you do now?" When it was suggested that it was necessary to clean up, she went to the mirror, primped herself, and beckoned to the administrator to clean up for her.

She used only her right hand. As previously mentioned she used only green and black colors. Motions were mainly large circular pulling down movements using the four fingers with pressure. Patting was made with four fingers. The whole hand was used for background motion, with the rhythm of four fingers showing. Rhythm is very poor (jerky) in the representation but slightly better in making her background (Figure 5).

The picture was split vertically; the right hand side being made gently and affectionately and the left hand side with violence and starkness and slaps were used instead of pats. Right handed balance overpowers the left hand side in volume while the left hand side shows greater pressure. Deliberate effort was made to separate the two halves of the picture with a very short sharp line. Symbolization was shown in how she made the two parts and what she said about them.

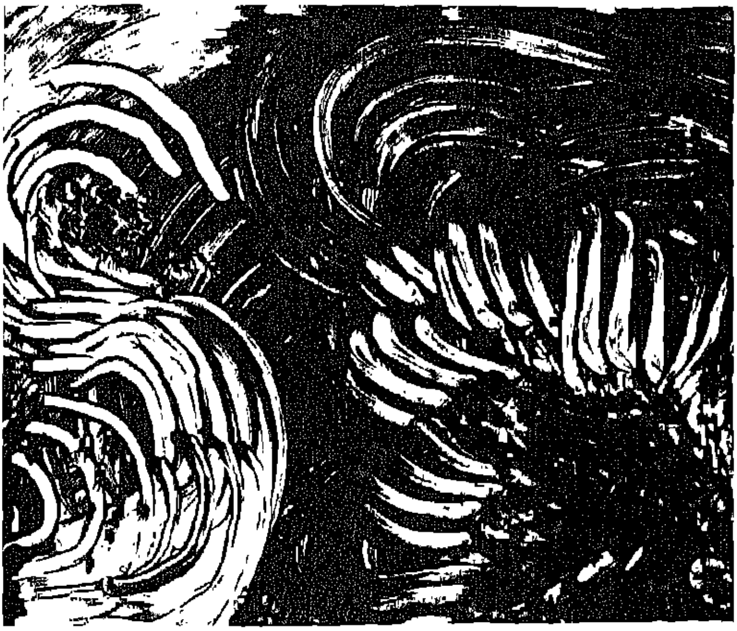

FIGURE 5
PARIS AND NEW YORK

Calling the administrator's attention to the right hand side of the painting representing Paris she described the richness and charms of that city, the world of interest it had for her, and of her happy life there with her husband saying she had lived happily there with him for the past 20 years. She further related how she "had him all to herself because no one ever saw him and she could have all of his time to herself." The left side of the picture represents America. A reality existed. It was cruel and it had speed—"everybody hurrying and not caring for the beauties one would find in Paris." "These two will never get together—I will not let them—I will make this mark to keep them from doing it." Then she related much about the happiness with her husband, in a whisper. Then abruptly left the administrator and walked over to wash her hands.

She later asked to use the phone and while she was telephoning, her nurse summarized the patient's history and told that her husband had been dead for over 20 years, that she became mentally ill soon after his death and that she has been in a mental hospital these past 20 years until the war. Although she is diagnosed as schizophrenic, yet because of her age and lack of violence, her family physician in America has permitted an attendant to be with her constantly rather than institutionalize her at this time. Her physician later confirmed the history and the diagnosis.

2. *Case II*

The case of a young Army man, aged 22, a patient in a military psychiatric hospital, under observation for acting queer and being inadequate in the performance of his duties, is presented here. He was very polite, good looking, neat, and apparently carefully reared.

During the demonstration in an occupational therapy ward, he moved about from place to place in an apathetic manner but at the same time watching the demonstration very carefully. He did not appear to be enthusiastic about painting and when asked if he would like to paint said, "I don't think I can" but hesitatingly started. As soon as he got started he continued to paint without rubbing out any of his productions. Directions were very carefully followed until he was about to apply color. Posture was poor. He stood on one foot and leaned on the left hand until he took brown paint. In order of use he chose blue first for the sky, then yellow for the earth, mixing in a little blue making green in spots. Then he used blue again for the river and brown for the mountains. In using brown he smoothed it out using his left hand as a palette. Fingers were almost entirely used throughout moving from right to left with the right hand. Movements in general were short and in a "dusting fashion." The last strokes were made in the same manner but from right to left with the left hand only after he had used the left hand as a palette. Very little water was added. He was very engrossed and tense. He wrote his name before telling his story and cleaned up meticulously to the point of closing the paint containers, washing his cloth, and spreading it to dry.

No title was given but he related the following story in a very deliberate manner without hesitation or embarrassment using short phrases and pointing to the objects he was describing.

> This is the sky—clouds—mountains—meadow—brook (and in a whisper added) it's all down under the sea. The clouds are fish—the mountains are the piles the fish make—the right pile is my father who makes the biggest pile—I'm in the middle and I make the smallest pile—on the right, that's my brother. The meadow is the sea-bottom and the brook is a serpent. The serpent goes round and round and eats up the piles but he can't get to the piles so he's blue cause he is in the water which is blue. The two big fish laugh and laugh but the middle fish is scared. These mountains are way out far away—nobody's ever seen them cause they're down under the water.

From the painting itself it can be seen that he used the right hand in a left handed manner (Figure 6). Only after he used the left hand as a palette did he make some right to left finishing marks. Only once did he use his left hand when he made the mark which identified himself as the smallest fish and cloud. (Later upon questioning he stated he was not left handed but that he wrote with his right hand but cut wood and played golf left handed.) The sequence of the application of color is blue, yellow, and brown. The colors became very symbolic as he described their meanings. Significant in the movements are the short brushing strokes used throughout. The exceptions were the use of a cloth to rub away background paint for the mountains and river. The fishes (brother and father) were made with vigorous single pounds of the fist while the center fish was made with a turn of the little finger of the left hand. This was made last of all. Movements were rhythmic. Balance is good but the texture is generally too dry. The order is strange—as a beginner rarely proceeds without hesitation and describes it with equal unexpectedness. Symbolization is very meaningful and yet simple. Brown mountains as piles seems to denote his exaggeration of amounts. The sky, clouds, meadows, river—all under the sea, is as illogical as the dual meaning given to each object. The ineffectualness of the snake who eats the piles but can't get to them is also illogical. The brushing wiping away movements could denote rejection for his father and

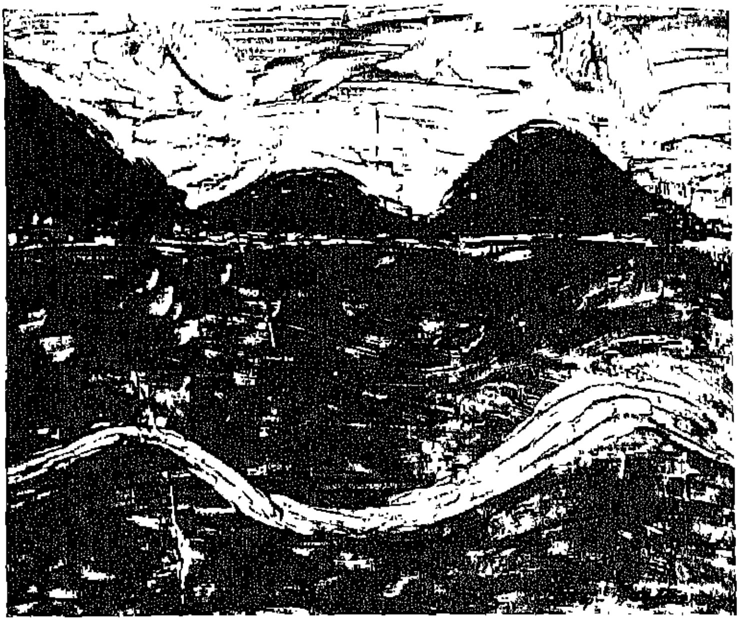

FIGURE 6
A FINGER PAINTING OF A SCHIZOPHRENIC

brother. The snake which goes round and round and which is headless and tailless may be indicative of the subject's defeatism.

Summary of significant findings: The landscape is made in six complete horizontal strata and then put under the sea really duplicating the number of strata. The serpent going around and around to consume excreta of fishes symbolizes his wish to destroy the person he identifies with the fishes. The verbalization is logical in parts but fantastic and incomprehensible as a whole. He is centrally located but represents himself as inferior to his father and brother, i.e., he is the smallest size mountain and smallest size fish (made with the left hand). The paranoid elements are shown by the subject being the central figure and balanced on both sides with mountains.

Diagnosis: Schizophrenia, paranoid type, with possible homicidal trends.

3. *Case III*

The case of a male patient, age 24, is presented here. He was a third year medical student in an accelerated program and was referred for behaving in a peculiar manner while at school. He was an honor student in undergraduate college and was doing well in his medical studies.

The physician called the subject from the recreation room of the observation hospital. He was playing checkers at the time and when asked to come up to paint he threw the checkerboard over and ran up three flights of stairs without waiting for the elevator. He appeared very anxious and couldn't wait for the demonstration to be completed when he started to paint himself. He was not amenable to following directions and they had to be given him step by step. He finally agreed to listen and then proceeded to paint. He talked incessantly about his abilities to paint with water colors and oils while he was smearing the paint around. He chose blue and covered the whole surface in a slap-dash fashion. He was very much preoccupied with painting his "vision" and was so talkative that the administrator at times became distracted and some observations were not recorded.

No exploration of hand effects was tried. The subject went right into drawing his vision with paint. He used much paint and attempted to use many colors on the bottom half while trying to paint his vision. He then told the administrator of the water color and oil paintings he had made and abruptly left but came back immediately to wash his hands and saying, "Don't destroy my picture, I'm coming right back." He brought back five water colors and three oil paintings of fair size which he started to describe as being better than Salvatore Dali's. He stood them up on a piano in the room and said he would paint a special picture about his vision. By this time his paint was drying so he had to add water and carelessly mixed all the colors getting a "mud" color. He tried to paint a cliff with this mud mixture and said he was going to "dismember his soul from his body." Then he rubbed out this picture leaving the blue in the upper left hand corner which he said must stay there. He then proceeded to add yellow and painted a higher cliff with rocks below and said, "They are not the Palisades and water beneath but are cliffs in my vision which has magic in the ore—this magic is power—which is God." He spoke a great deal about power and tried to portray it. He didn't like the mud color and took a rag and rubbed all the paint off except the blue in the upper part, became very discouraged and said, "I don't think I could do it." He proceeded to talk about his medical school and discussed his best friends in his class while now adding green paint and mixing it with more blue. "I can't paint my vision." The physician encouraged him to paint. He attempted to paint the cliffs again and told the administrator how good this kind of painting is for sick people. "When I came in here," he continued, "I had headaches and heat pains and I don't sleep very well. I don't sleep very well because my window high up in my room looks over the lake but if there was magic in the ore here I could dismember my soul from my body."

The picture was his seventh attempt to paint his vision. "Now I have an idea" and he finally painted his vision (Figure 7). He was very elated because he got what he wanted. This picture was painted very quickly. When he finished his painting he did not want to clean up saying there are others who could do that. Finally he was told to clean up and did so very lackadaisically but not without specific reference to it as an unpleasant task. He was careless in his painting and very careless in washing himself and cleaning up, splashing water on the tables and the floor.

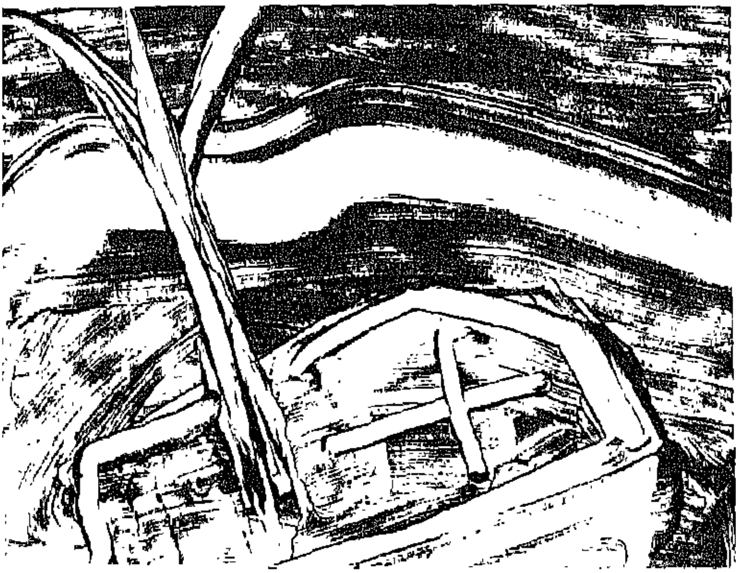

FIGURE 7
THE SOUL DISMEMBERED FROM THE BODY

He painted all the paintings using his right hand only. His dominant color was blue with green added. The upper right hand corner remained blue throughout the whole process. A little smear of black was placed on the coffin to represent "the container of death." His movements for the background consisted of vigorous left to right motions. He made mountains with added pressure to "show the magic." With his fingers moving in clockwise manner he made irregular lines representing the top of the coffin and around the soul he broke his lines and finally added a touch of black on his last downward stroke going off the bottom of the paper. Four attempts were made to make the coffin—each time ending by running off the bottom of the paper. The "soul" was made by using the side of his hand in upward strokes. The cross was made with one finger and with force. His rhythm was very poor, as evidenced by his background and poor construction of his coffin. Texture in general was good. Balance too was poor. Order in general was poor since the lines of direction were erratic and he showed poor control of his medium. Posturally he showed ease of stance but it was not directed. Symbolism, it is felt, is clearly revealed in his verbalization.

He titles the picture "The Soul Dismembered from the Body." In his verbalization he related how he was trying to make a vision that he had when he stood on a cliff. He had this vision many times he said.

> The first time when I was eight, nine, ten or four years old—what difference does it make. I was standing on the cliffs along the Hudson River and instead of seeing the Palisades on the other side I saw a vision. I had the power even when a child to go out of my body and leave my body standing there but no one ever caught my body without my soul in it cause I'm smart. My soul could learn so much without my body in a short length of time. That's why I'm able to take accelerated courses and be an M.D.. When you look at this you won't understand it (to the administrator) because you're not very intelligent —but don't worry cause nobody is very intelligent except me. You look at this vision and what do you see? You don't even know! You think it's a coffin with a body in it. It is a coffin but you can't see the body—it's covered up. But out of the body rises a desire which is a cross—a symbol of man's salvation. The salvation of man keeps a body dead while the soul rises in the form of a trinity and goes to this side of the mountain (above the horizon) of which the soul is a part. You think this cross is lying on the body but it is not. It floats unattainable to most human beings—only a few like me can get it. So you see, you are damned to disintegration—I feel sorry for you.

Then the administrator said. "But you are in the hospital and I'm not; maybe I'm intelligent too." The subject replied, "But I can go to the cliff anytime and have my vision (and whispering continued) and I'll do it some day since I have the power of salvation and my body wouldn't hurt."

This same story was repeated with variation but the contents remained the same.

Summary of significant findings: Four horizontal strata are vaguely portrayed but definitely described. Hallucinations and bizarre performance is characteristics of these four friends; their loyalty, their obedience to him, and how well they salute him. He continues: "And the grass in the garden (at bottom) are 'hairs' that grow in the earth"—(the "hairs" were rigid, sparse, and lacking in order)—"and here (in lower left hand corner) is a rabbit or some little animal which keeps watching my garden and doesn't let anybody in." He speaks of this little animal in a very affectionate manner. Clouds were painted at the top so that "even the sun can't come in." He expressed regret that the indenture of the cloud didn't come in the center over his "tulip" and placed three birds in the space to fill it out. Referring to the birds he said of them, "One for the sergeant and two for the corporals and that makes the picture prettier." "Now everything is pretty in my garden—but wait a minute"—(pointing to the two trees entering from the mid-side)—"everything you do in this man's army is always messed up—here is my pretty garden with my tulip, and coming in on both sides are trees—stinkweeds—and they are damn shavetails always interfering."

The painting shows all movements to be from left to right indicating that the subject is right handed (Figure 8). Black was the only color used.

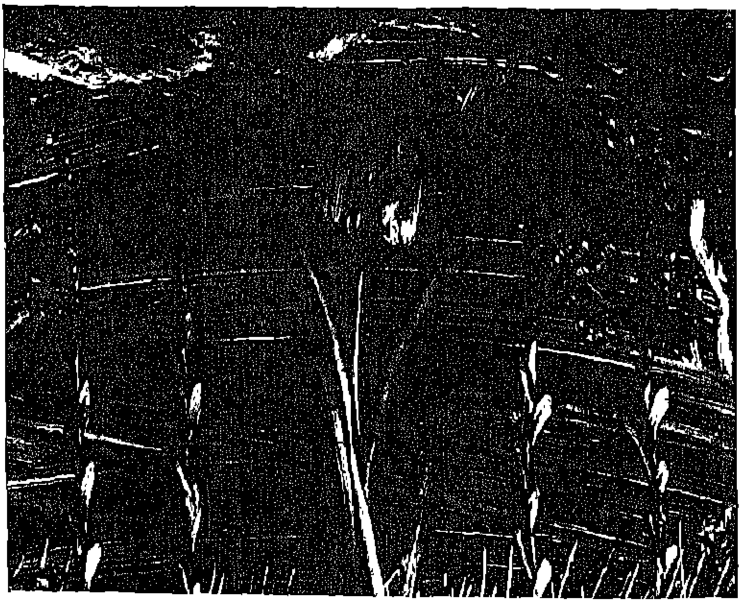

FIGURE 8
IN MY GARDEN

The background was done in figure eight style with oblique loops showing good coördination but disturbed by violence. Pushing out movements were used in making the tulip and the leaves of all the flowers, but pulling in movements were used in the flowers of the corporals and the privates and some grass. The leaves of the trees were made with violent taps while the flowers show controlled tapping. The grasses were made by scratches; some up, some down, and some oblique—mostly leaning toward the right. He showed 2/4 rhythm repeated three times indicating good repetition, good spacing, and good rhythm. Although he approached the other side of the paper to paint the clouds, balance is good. This form of behavior is rare but the good balance is corroborated by good position, repetition of other objects and filling in of spaces. The order is good but not consistent as shown by pulling down in some places (some flowers and grasses). Order need not be consistent if it is symbolic.

Concerning symbolization, the tulip is often described in Finger-Painting as being a flower of the male. The daintier flowers show subordination to the dominant flower. It is interesting to note that the lower trunks and roots of trees are not in his garden but are intruding by entering from the sides. Of symbolic significance also is the violence with which he made the trees. The things permitted to enter the garden (small animals and birds in action) also belong to the sergeant denoting possession. However, the possibility of admission of others "into his garden" may be demonstrating the possibility of willingness of recognition of other people and significant in the prognosis of the case.

Diagnosis: Since composition and balance were good showing no deterioration and delusions were not bizarre and there were many tendencies to self-reference—according to Finger-Painting analysis he would be a true paranoic and not a paranoid-schizophrenia.

Confirmation: The medical officer in charge states that the patient under observation was diagnosed as paranoid and was suffering from persecution of officers in the army. As such he couldn't be shipped overseas for active duty.

C. INSTABILITY

Two additional cases illustrating emotional instability through guilt and through rejection are herewith appended to indicate other attempts at diagnosis through the Finger-Painting process.

1. *Case V*

A Navy man, aged 28, was referred for being "disobedient" and for refusing to sleep with others in the room because he was afraid of talking in his sleep. It was impossible to elicit reasons from the subject which would give some basis for his behavior.

He painted his picture in a few minutes but verbalized for a long time (Figure 9). He was very much absorbed in the procedure, followed directions correctly and used fingers, hands, and arms with assurance. He used green throughout because he "loves green." After he completed his painting he added a minute dab of brown in about the center of the picture. He cleaned up neatly while telling how much fun he had. He did not repeat the performance.

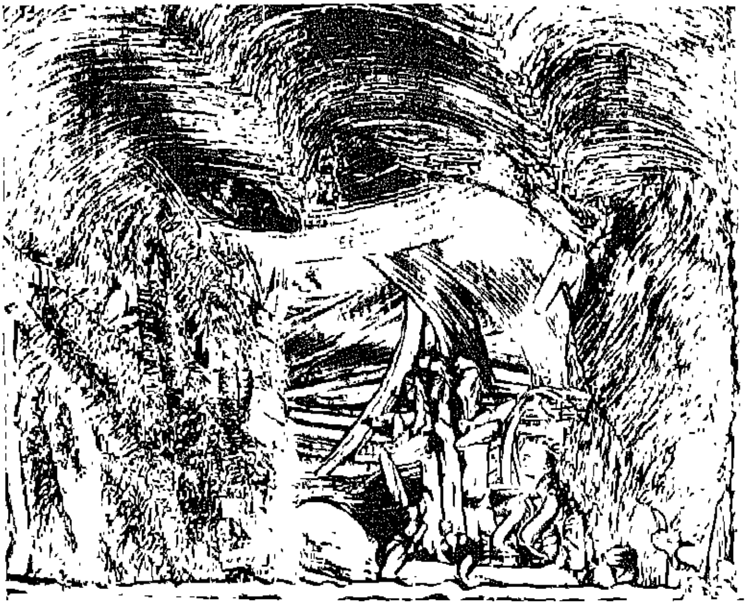

FIGURE 9
In a Cave

He was right handed and used only the right hand in the painting. Motion in general was good and free. Rhythm and balance were good. The order of the picture as a whole is the shutting in of contents of the picture. In his verbalization he asks for criticism of his painting and then titles it "In a Cave."

Referring to the three figures in the cave he stated to the administrator, "You think it's mother and father and child but it isn't—it's the same person three times. The first one is fourteen years old, the third one is sixteen years old, and the middle one is 18 years old." When the administrator showed interest he explained, that when he was 14 years old he "got in trouble with a girl who taught him things."

> Then she told the teacher and that was a helluva mess—but my father fixed it up for me and the girl's family moved away—she was a bad girl. Then when I was 16 a woman who lived upstairs over a store invited me and another boy up to her room where she had a friend. My father who is the mayor got me out of this trouble and he and the preacher cleaned up the town and these women left. When I was 18 I visited a friend in his town and I fell in love with a friend of his—a nice girl—but we loved too hard and I got into trouble again. As my friend was going to join the Services I went with him and joined the Navy. Then I went home and told my father and he was so disappointed that I didn't tell him about the girl. I was afraid to. I left home in a few days and couldn't make up my mind to tell him and now its been nearly a year and I want to know what's happened to the girl. I don't care what my father would say cause I love that girl. The fellows say I talk in my sleep and I'm afraid I'll talk about her and tell her name. It's a helluva mess—what must I do? Pointing to the brown dab he asked, Do you know what this brown thing is? Well I won't tell you.

Diagnosis: Instability due to marked feelings of guilt, based on sex experience.

2. *Case VI*

Frank, a 13-year-old boy, was committed to an institution for delinquent boys for deserting his home on several occasions. While being observed in a *psychiatric hospital before* commitment *he gave a fictitious name and made up* a fictitious story about himself, which story and name he kept for more than two weeks until the Missing Persons Bureau identified him. His natural mother died and the father remarried in a civil ceremony. The boy's full brother and sister have been placed in foster homes. He was living with his father and step-mother and step-brother aged two and one-half and step-sister aged one year at the time of commitment.

Case study by the writer, the psychologist at the institution, revealed a timid, insecure and unhappy looking boy of average intelligence, very soft spoken and coöperative. Slight subject disabilities in reading and spelling were *primarily due to a bilingual handicap.* During his stay of over a year at the institution he received no visits or letters from his parents. His was a case of delinquency based primarily on neglect. He was discharged to an aunt in Florida and follow-up reports indicate good adjustment thus far. Finger-Painting done by the boy while at the institution reveals the marked rejection of his home and parents which were the etiological dynamisms in his behavior disorder.

He showed much interest in the demonstration and eagerness to paint but was so emotionally unstable that he said repeatedly he didn't know what to paint. He finally stated he was going to paint the cottage, tree, and dairy he saw from the clinic window and proceeded to paint his window. All directions were followed with the exception of covering his whole paper when working in the paint. He was right handed and used his fingers only. After 20 minutes of working with dry paint and fingers in a stiff and rigid manner he became relaxed and used the fingers of both hands. As he became freer he used more paint, added more water, and later even became sloppy. Posture in general was poor. He cleaned up slowly and neatly. Movements were mostly of a smearing nature and done with the fingers only. Texture could be considered dry. Balance and composition were good. A variety of colors were used and with a good sense of reality. Order is poor. No errors were made in his only pattern of composition, he shows no run-ins and everything fits.

He did not give the picture a title (Figure 10). Although he stated at the beginning he was going to paint the scenery he saw from the clinic window he verbalized the following statements, referring to the cottage as his house and to the dairy as the dog house.

> This is a story I read and I'll tell you about it. This is the house that Jack built. Here's where Jack's little dog lived that worried the cat that ate the rat that ate the moss that laid in the house that Jack built. Under this tree stayed the cow with crumbled horns that tossed the dog that worried the cat that ate the rat etc. . . . I forgot to put in the steps that go into the house. There should be birds and clouds in the sky but I forgot that too. I was busy thinking about my house and the tree. The tree gives shade cause in the summer it's hot. I can't draw an old lady and an old man. She's the one who milks the cow. One day the old man went up to her and said, "Will you marry me?" He kissed her. They went to the priest to get married. I had no place for the rooster—he woke the priest to marry the man and woman.

Significant findings: The boy identifies himself with the dog and living in the dog house—not in his house. Omissions of the door to his house is symbolic in his rejection of home as well as the birds which should be in

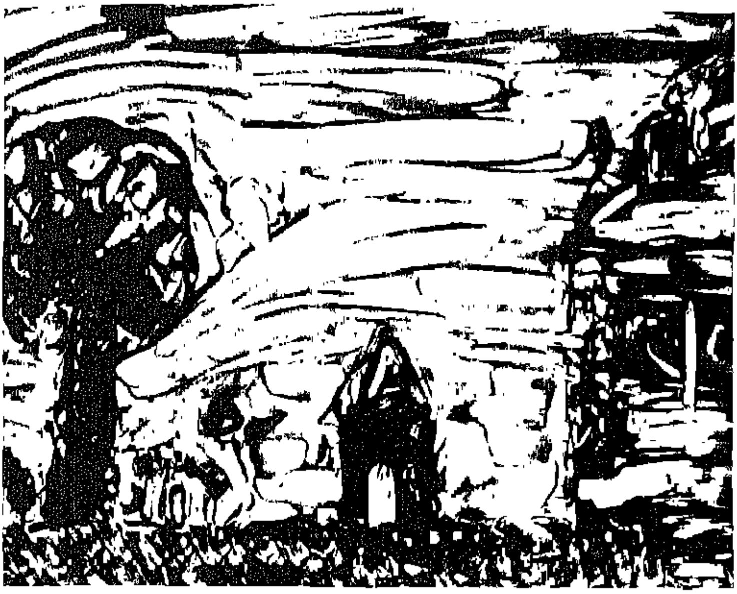

FIGURE 10
FINGER-PAINTING OF A REJECTED BOY

the sky indicative of his emotional state. Other symbolism is evident in his verbalization.

Diagnosis: Situational behavior disorder and emotional instability due to factors of rejection.

It may be inserted here that all data and evidence gathered in the course of this project could not be included in this document. The necessity of limiting the number of sub-problems forces the writer to omit certain considerations, which cumulatively would effect a more complete understanding of this technique.

This additional evidence, however, is presently being prepared as a series of articles. They will include a record form, now undergoing final revision, in which significant aspects of the behavior performance, the painting proper, and the verbalization are organized and made part of the record. Clinical records will be presented to give added scope and content to the divers behavior classifications and their interpretations. Also in process are tabulations of typical responses for each category which the writer feels is indicated to insure a more accurate interpretation of the total process.

VIII. SUMMARY, CONCLUSIONS, AND SUGGESTIONS

The purpose of this study has been to define, describe, and present Finger-Painting as a clinical instrument in personality diagnosis, appraisal, and therapy.

A. Summary

The problem as mentioned above, has been stated and discussed, and the literature has indicated the trend and need for the further development of projective techniques for personality appraisal. Finger-Painting is one such technique.

The history of Finger-Painting has been presented from its origin in Italy in 1922, and its chronological development has been traced to date. This orientive background has also been supplemented with other applications of this medium as used in programs of education, recreation, arts and crafts, art development, and as a decorative device. This developmental narrative has been enriched with the educational philosophy of Ruth Faison Shaw.

The materials which go to make up the Finger-Painting kit have been illustrated, presented, and described. The kit consists of the following materials: a set of Shaw Finger-Paints, Shaw Finger-Painting paper, a water resistant surface upon which the paper is placed, a large receptacle in which to wet the paper, a small pan to keep the painting wet during the process, a spatula for each different color of paint, a bucket and wash rags for cleaning up, a pencil and a set of crayons which is to be used by the subject to identify his painting, and a cardboard or newspaper upon which the paintings are laid out to dry. The materials just mentioned are arranged in a definite order in preparation for the project. Also, the kit and supplementary materials are described from the viewpoint of color, consistency, odor, harmlessness, washability, and standardization. The set of paints consists of six colors, namely: red, blue, green, yellow, brown, and black.

The method of administration is rather unique. In setting a pattern of directions for the individual, the administrator demonstrates the routine of procedure while carrying on a "patter of conversation" about what he is doing so that the patient, in turn, may portray his own version of the story.

The routine procedure is carried on in three distinct parts, each part leading to the next. These include the preparation of the materials, the painting itself through the manipulation of the materials, and finally the finishing of the job.

A large section of this document is devoted to the breakdown and description of the various categories and their respective subdivisions. These categories, together with the interpretive aspects, constitute the core of the technique. The categories are: handedness, color, motion, rhythm, texture, balance, order, symbolism, and verbalization. Each category has its respective connotations in the final appraisal of the personality.

Various factors in the observation of the physical performance of the patient-in-action have also been described and their relationships to personality have been indicated. These factors include: posture, manner of approach, position of attack, the starting hand, various parts of the hand used, lines of direction of movement, timing with which water is added, extent of surface covered automatically, type of pattern painted, progression, neatness, the performance cycle, satisfaction or displeasure at the end, emotional relaxation or stimulation, verbalization with hands in bucket, and desire for repeating the performance.

It is of paramount importance to repeat here that personality appraisal should be attempted only when the three main aspects of the Finger-Painting technique are studied together, viz: the behavior performance, the finger-painting, and the verbalization.

At times there arises a situation where the Finger-Painting projections may suggest certain dynamisms of behavior. These suggestions may be confirmed or denied through the administration of Finger-Painting in a series, i.e., additional painting sessions. Added sessions may also be indicated when the necessity for making a differential diagnosis arises.

Case evidence has been gathered and presented and its relationships to personality indicated. These data have been gathered over a period of more than five years. Illustrative cases and their diagnosis have been presented in such fashion as to demonstrate the applicability of Finger-Painting in the study, analysis, and appraisal of personality. Finger-Painting evidence of the schizophrenic, paranoid, and unstable personalities have been described and their finger-paintings used as illustrations.

Finally, the summary, conclusions, and suggestions for further research together with a bibliography and a glossary of technical terms have been included. The bibliography comprises the Finger-Painting literature for various fields of interest.

B. CONCLUSIONS

From the evidence presented in the context, it is clearly demonstrated:

That Finger-Painting as a projective technique does contribute to the appraisal, study, and further understanding of human personality.

That used as a creative instrument, Finger-Painting does encourage self-expression which, with other devices sometimes appears difficult or even impossible.

That by reason of its being both a verbal and a performance experience it more closely approaches a reliable method of appraising the total personality.

That because it is possible to use it with those age groups where speech is not fully developed its general applicability as an instrument of communication is extended over certain other projective techniques.

That its lack of rigid and quantitative method enhances the possibility of application when one considers the total complex and interrelated dynamisms which make up the total personality.

That a definite syndrome for the schizophrenic personality can be elicited through this medium. The characteristics of this syndrome are: two or more strata representations invariably found in such productions. These strata are illogical, unrelated, disorganized, and incoherent. The degree of deterioration is in proportion to the amount of composition and balance in the painting. The verbalization used by the patient in explaining his production follows the same characteristic lines as found in his painting. Here, too, he is incoherent, illogical, disoriented, delusional, and lacking in reality as evidenced by the constant change of meaning and identification he ascribes to the elements of his production. It is especially to be noted that with the schizoid personality whispering is present either during the process of painting or during the verbalization.

That a characteristic group of symptoms for the paranoid personality has also been elicited through the Finger-Painting technique. The syndrome contains several symptoms quite different from any other pattern of behavior. There is always a central figure placed in the very center of the picture and integrated with the rest of the picture. This central theme is well balanced on either side with other objects for the purpose (as the subject explains) of protecting the central object with which he usually identifies himself. In addition, protection in more than one form is also evident both in the painting and in the verbalization. Also, some form of verbal violence is noted. Objects that thwart are shown in the painting and confirmed in the verbalization.

That in Finger-Painting, diagnosis and therapy can go along concomitantly. This adds to the usefulness of the Finger-Painting technique as a practical clinical instrument.

C. SUGGESTIONS FOR FURTHER STUDY

The study made thus far does not exhaust the potentialities of this technique nor is this assumed to be the perfect method of personality appraisal. The writer is aware that several years of additional research and study are necessary for the further evaluation and perfection of this technique. However, he feels that the material presented herein serves as a necessary basis for the promotion of further research in personality analysis with this Finger-Painting device. The findings as presented in the previous chapters indicate the need for further investigations.

Concerning the technique itself many investigations naturally will flow out of the work just completed. This should include a refinement of the techniques; the collection of more data for confirmation or rejection of present findings; the use of Finger-Painting as a possible group method of personality study; the devising of a form for convenience in recording the three major aspects of the technique, namely: the physical behavior, the painting, and the verbalization. Further investigation is also suggested to determine the degree of validity which exists between the administration of this medium in one painting and that in a given series.

A great deal of investigation and work with Finger-Paints is still necessary in order to discover its potentialities in other allied fields, such as rehabilitation, occupational therapy, etc. Further investigation must be made before Finger-Painting patterns and syndromes of other psychotic classifications may be developed, i.e., manic-depressive psychosis. The application of the Finger-Painting technique should prove a fertile field in the investigation of neurotics and psychoneurotics. Because the possibility of using this medium in therapy with stammerers and enuretics has already been shown, these two particular avenues of investigation should be explored. Theories which have been postulated in the field of neuropsychiatry should be continued in order to discover whether any personality projections portrayed through finger-painting reflect an organic basis for the behavior in question, i.e., birth trauma, head injuries, epilepsy, results of frontal lobotomies, etc. An experiment to unfold possible relationships between finger-painting and levels of intelligence should be revealing. The applicability of Finger-Painting as an index to certain aptitudes might also be investigated.

Further, Finger-Painting appears to have promise as an aid in therapy. This should be investigated to see in what ways this medium can aid the psychotherapist.

Interesting as well as revealing stories by subjects have often given clues in uncovering the basis and origins of fears, frustrations, conflicts, repressions, hates, rejections, anxieties, etc. All thse dynamisms should be investigated by the Finger-Painting medium.

The developments of these suggested researches naturally would lead to other problems not foreseen at present.

With all these potentialities therefore, finger-painting, adding to and not substituting for other methods of personality diagnosis, cannot be overlooked in the present search for more helpful clinical methods of personality appraisal.

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